

THE LARYNGOSCOPE.

Vol. XIII. ST. LOUIS, MO., NOVEMBER, 1903. No. 11.

ORIGINAL COMMUNICATIONS.

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THE TONSIL AT BIRTH.*

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The plica triangularis, as is well known, is a fold of mucous membrane which is reflected from the anterior pillar of the fauces onto the tonsil. It may extend part way down the anterior face of the tonsil; it may reach the bottom of the vertical axis of the tonsil, or, in certain cases, extend around the tonsil like a sling and unite with the posterior pillar. This fold is an early foetal formation. Behind it, and above the tonsil, is a space to which the name supra-tonsillar fossa has been given. This is bounded on the outside by the superior constrictor muscle and above by the soft palate. In the adult this fossa, as measured with a probe, often extends to the front edge of the anterior pillar, down to the root of the lower jaw and up into the soft palate. A dissecting room subject, unless it has been prepared with an injecting fluid which contains glycerine shows very little trace of the tonsil. If the subject has been injected in this manner, the lymphatic tissue of both the faucial and the pharyngeal tonsil stands out. I found the supra-tonsillar fossa nicely open in three such subjects and could easily determine its size. The accompanying drawing was made from such a specimen. (See Fig. 1.)

In order to determine the size and form of the plica triangularis and the extent of the supra-tonsillar fossa at birth, I examined thir-

* From the Laboratory of the Anatomical Department. Drawings by the Author. April, 1903.

teen embryos between the ages of four and five months, six at five months, six at six months, two at seven months and forty-three full-term babies. The larger heads were sawed in halves while frozen, and then thawed out. The fossæ about the tonsil were determined with a fine probe, a drawing made of each, and the results compared and grouped. The findings are given in this paper. The subject of the paper, therefore, is the tonsil at birth.

It is necessary to start with a short review of the embryology of the pharynx.

Embryology. The anterior part of the fore-gut, the area of the pharynx, enlarges and the hypoblastic layer throws out five projections on either side from above downward. Opposite these bars the

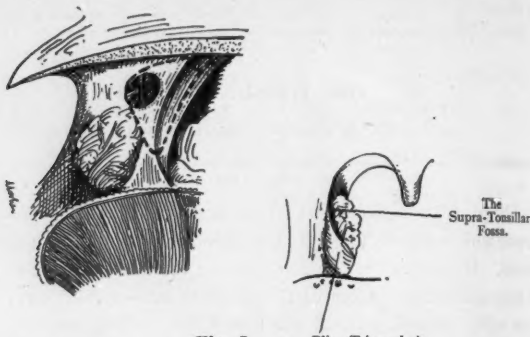


Fig. 1. Plica Triangularis.

Showing the extent of the supra-tonsillar fossæ. The cadaver from which the drawing was made had been injected with a fluid containing glycerine. The tonsillar tissue on the outer wall of the fossa is well shown. The soft palate as the roof of this fossa, comes out clearly.

epiblast projects inward and makes four clefts in the pharyngeal wall.

The first arch is called the mandibular arch. From it the upper and lower jaw are developed.

The second arch is called the anterior-hyoid arch. From it the anterior pillar of the fauces and a part of the hyoid bone are developed.

The third arch is called the posterior hyoid arch. From it are developed the body and greater cornu of the hyoid bone, and the posterior pillar of the fauces. The fourth and fifth arches form no special structures. (See Fig. II.)

The first cleft, the space between the lower jaw and the hyoid bone, is called the hyo-mandibular cleft. From it are developed the Eustachian tube, the middle ear, and the external meatus.

From the second cleft, the space between the second and the third arches, the fossa of Rosenmüller and the sinus tonsillaris are formed. The former from the upper, and the latter from the lower part.

The palatal processes of the upper jaw grow inward, meet in the median line and form the palate. These plates extend backward, cross the cleft between the first and second arches and divide the foetal pharynx into two parts. Above the palate in the first cleft, the Eustachian tube is developed, behind it, developed from the second cleft, is the fossa of Rosenmüller. From this second cleft also, but below the palate, the tonsil develops in the upper part of the lower half, which here has the name of sinus tonsillaris. Some of the cleft above the tonsil is unoccupied and gets the name of the supra tonsillar fossa.

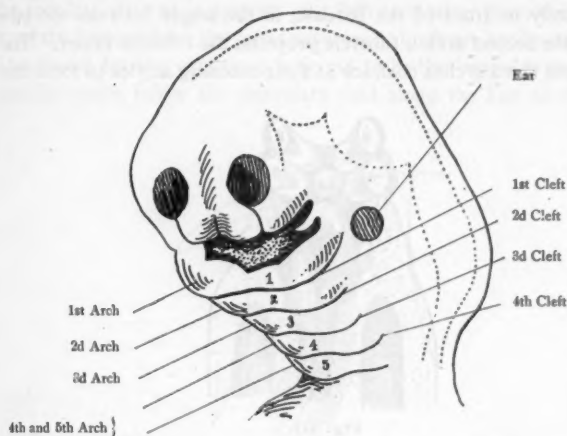


Fig. II.

Head of embryo to show the arches and visceral clefts and the structures which they form.

1st Arch. Mandibular arch.—Upper part, Maxillary arch; lower part, Mandibular arch. Incus, Malleus, Processus Gracilis of Malleus. 2d Arch. Anterior hyoid arch.—Stapes, styloid process, stylo-hyoid ligament, lesser cornu of hyoid bone, anterior pillars. 3d Arch. Posterior hyoid arch.—Body and greater cornu of hyoid bone, posterior pillars. The 4th and 5th arches coalesce with neighboring tissues and form no special structures.

1st Cleft. Outer part internal ear; inner part tympanum, Eustachian tube. 2d Cleft. Fossa of Rosenmüller, sinus tonsillaris. 3d Cleft. Thymus. 4th Cleft. Lateral lobes of thyroid.

The faucial tonsil arises from an invagination of the hypoblast in the sinus tonsillaris. The diverticulum thus formed subdivides and lymphoid tissue is formed around the primitive crypts. In early foetal life the anterior pillar widens and extends backwards, forming a triangular fold partially covering the cleft in which the tonsil develops. In this way the anterior face of the tonsil and the supra-tonsillar fossa may become more or less completely covered by the thin free

border of the fold or *plica triangularis*. His gives a slightly different version of the formation of the *plica*. He says that the tonsillar cleft at the time of closure—four to five months—is a shallow pouch bounded in front by the anterior pillar (from the second arch) and that the pouch is partly covered by the uvula which is continued onto the wall of the pharynx as a fold called the *plica triangularis*. This bounds the pouch on the dorsal side. The tonsillar fissures branch at four months and buds of tonsillar tissue continue to be formed for a year after birth.

It is necessary in this connection to say a little about the posterior wall of the foetal pharynx. (See Fig. III.) A forked elevation termed the *furcula* separates the second and the third arches. A groove in the center of this extends to the entrance of the larynx. Immediately in front of the *furcula*, in the angle between the two arms of the second arch a tubercle projects, the tubercle impar. The second and third arches coalesce at their receding angles to form one

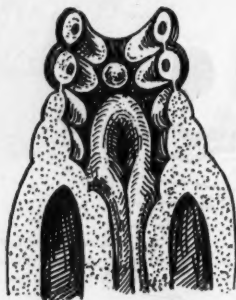


Fig. III.

Inside of foetal pharynx, showing arches and clefts. (After His.)

structure with four projecting arms. These grow forward into a V-shaped projection enclosing the tubercle impar and making one mass to form the tongue. The epiglottis is developed from the *furcula* and from it also develop the aryepiglottic folds and the arytenoid cartilages.

The youngest embryos which I examined were between four and five months old. There were thirteen of these. In them the tonsillar cleft was not closed, but the *plica* had long since been formed. Fig. IV. represents the conditions which are found at such a time. The anterior pillar is at least twice as wide as the posterior pillar, so that the tonsillar cleft is placed much nearer the posterior pillar than

the anterior. The cleft runs from just below the palate diagonally downward and backward to the base of the tongue. The posterior lip of the cleft is not well marked and hard to distinguish from the posterior pillar. The anterior lip, on the other hand, appears as a very distinct edge. It may be an even edge or lightly serrated. In the majority of cases, about a third of the way down this anterior edge a secondary fold separates from it and runs obliquely across the tonsillar cleft. This makes the lower boundary of the tonsil. Above this division of the anterior edge and in front of the tonsil there is a fossa, and below, between the anterior edge and its offshoot, there is a still more extensive fossa, which runs forward under the anterior pillar nearly to its front border. By bearing in mind this picture of the tonsillar cleft as it appears just before closing time, the majority of the forms which the tonsil assumes at birth are easily explained. The reason for the variations is found to be the irregular deposit of tonsillar tissue below the secondary fold along the line of the orig-



Fig. IV.

The sinus tonsillaris before closure. Below the tonsil the anterior border of the cleft runs down and backward as a marked fold. Where this leaves the tonsil there is a deep cleft. A second fold starts from this fold and makes the inferior boundary of the tonsillar fossa proper.

inal cleft, irregular closure of the anterior edge and its offshoot, and irregular closure of the tonsillar cleft as a whole.

I found this foetal condition persisting in one head at nine months; it is more common, however, to have the anterior edge persist simply as a fold running from the lower anterior border of the tonsil down and back toward the base of the tongue. (See Fig. XI.)

The remnant of the tonsillar cleft is seen at birth as a crescent-shaped slit. It lies nearer the posterior pillar than the anterior. It seems so much like a reduplication of the posterior edge of the soft palate, both in its curve and direction, that one immediately thinks

of His's description of the formation of the plica by the continuation of a fold from the uvula onto the wall of the pharynx. Whether the plica owes its formation to this or to the broadening and growth of the anterior pillar backward, the result in either case is the same, and is seen most plainly at birth; namely, the anterior pillar is fully twice as wide as the posterior pillar. Instead of being three-fourths of a circle and crescent shaped, the tonsillar opening may be a complete circle. Further, the openings on the two sides, although generally roughly similar, may be entirely different, both as to form and as to size. Fig. V. gives the average condition of the tonsillar region at birth. The figure gives also the average measurements. In ten out of forty heads—one in four—the tonsillar opening was double. Occasionally it was double on both sides; generally, however, the double opening occurred on one side only. Once I found a triple opening.

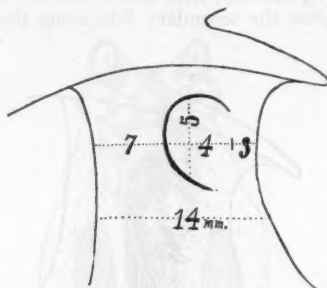


Fig. V.

Measurements of the tonsillar region at birth.

The various forms of double openings are given in Fig. VI.

The adult tonsil is placed on the side wall of the pharynx. It is attached to the inner face of the superior constrictor muscle of the pharynx, a fascia intervening. Its position is vertical. The tonsil at birth is nearly horizontal. The greater part of it appears as if attached to the under side of the soft palate. Only the outer edge comes into relation with the side wall of the pharynx. In order to see this the pharynx must be entered from behind. If it is approached in the usual way from the front by opening the jaws and by depressing the base of the tongue the pliable tissue of the soft palate is stretched and the tonsil is pulled down onto the side wall of the pharynx and assumes more of the adult position. At what age the tonsil assumes the vertical position I do not know. Frozen sections show that it is vertical in the adult. In the head of a child of about

two years I found that its position was obliquely horizontal, not frankly vertical. The horizontal position, or, even the obliquely horizontal position makes the drainage of the tonsil better. Especially is this true of the supra-tonsillar fossa. Frozen sections show that the tonsil is closely applied to the back of the tongue. The un-

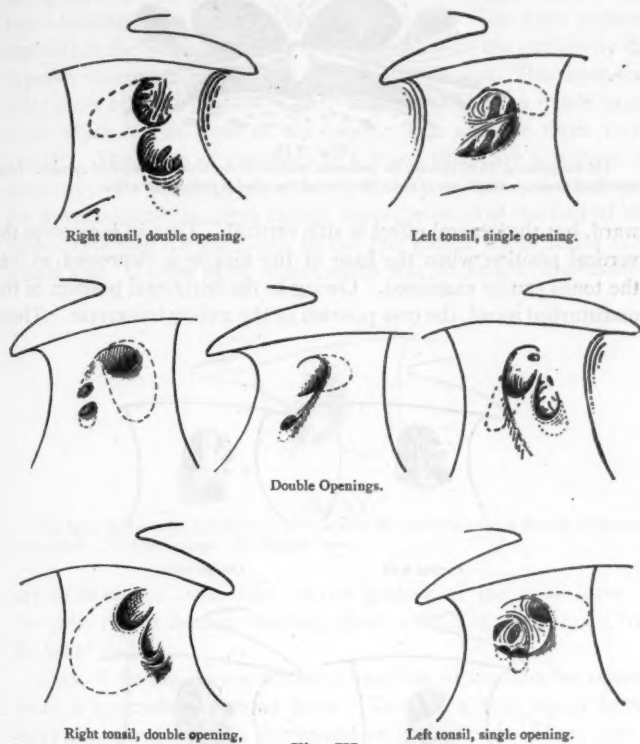


Fig. VI.

Forms of double tonsillar opening.

dulating motions of the tongue in swallowing would, therefore, tend to empty the supra-tonsillar fossa and the tonsillar crypts. In the adult, on the other hand, as the fossa is vertical, the movements of swallowing would tend to shut the fossa like a trap.

The tonsil at birth is able to assume the horizontal position without disturbing its relations to the superior constrictor, owing to the fact that the pterygo-maxillary fossa is relatively large at birth and

well packed with fat. From this it follows that the superior constrictor readily folds inward. (See Fig. VII.)

In the great majority of cases the tonsil at birth has a distinct axis. This is usually vertical. It may incline forward or backward,

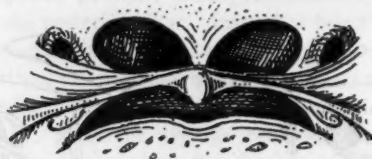


Fig. VII.

The soft palate at birth, showing the horizontal position of the tonsil and tonsillar opening. In depressing the tongue enough even to make the drawing, the tonsil is pulled down a little.

ward, but the general effect is still vertical. That is, it assumes the vertical position when the base of the tongue is depressed so that the tonsil can be examined. Owing to the horizontal position of the undisturbed tonsil, the true position of the axis is transverse. There

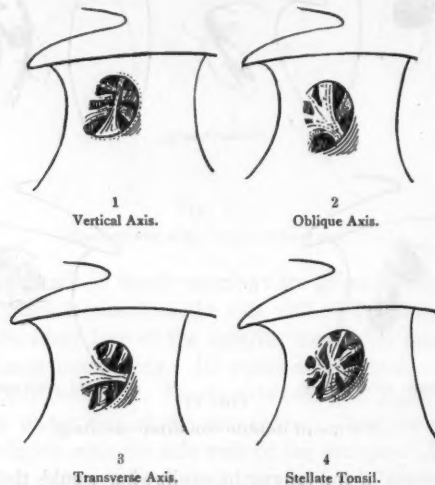


Fig. VIII.

The different forms of tonsillar Axis.

is a row of well-marked crypts in front and another behind the axis, and then the crypts become irregular toward the periphery of the tonsil. Instead of being vertical the axis is occasionally horizontal. Again, no axis may be present or the tonsillar openings may assume

a stellate form. Fig. VIII. illustrates the different forms of tonsillar axis.

The most interesting part of the study of the tonsil at birth is the determination of the position and size of the fossæ about it, and the bearing which they have on the form of the plica triangularis in the adult. Of late the clinical importance of the supra-tonsillar fossa has been well brought out. The fossa embryologically is the space above the tonsil, bounded on the outside by the superior constrictor muscle and in front by the plica. The supra-tonsillar fossa at birth is usually small and merged into a much larger fossa which lies in front of the tonsil. This anterior fossa varies greatly. The limits of variation, as I found them, are best given by diagrams. It was noticeable that where there was a distinct axis the lower edge of the fossa sprang from the front of the root of this axis. This was the case also, in the few tonsils which had a horizontal axis. In the cases where there was no axis it was custom-

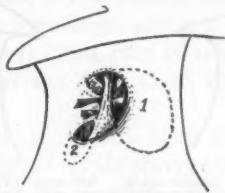


Fig. IX.

This figure represents the form of tonsil which occurred the greatest number of times in my specimens. Axis vertical. (1) Anterior fossa. (2) Posterior fossa.

ary to have the lower edge of the opening of the fossa leave the crescentic rim of tonsillar opening about a third of the distance from its lower end.

Back of the axis in the posterior quadrant of the tonsillar opening there is generally a second fossa. This, as a rule, opens from a large crypt, and extends downward and backward. There may be two of these small fossæ. What might be called a typical tonsil or, what is better, the form of tonsil which predominated in the majority of my specimens was a tonsil with a vertical axis and with an anterior fossa which started from the base of the axis and extended down toward the root of the lower jaw, then forward toward the front of the anterior pillar and then up and above the tonsil. (See Fig. IX.) Back of the axis there was a small posterior fossa which opened from a crypt. The extent and variety of these fossæ are given in Fig. X.

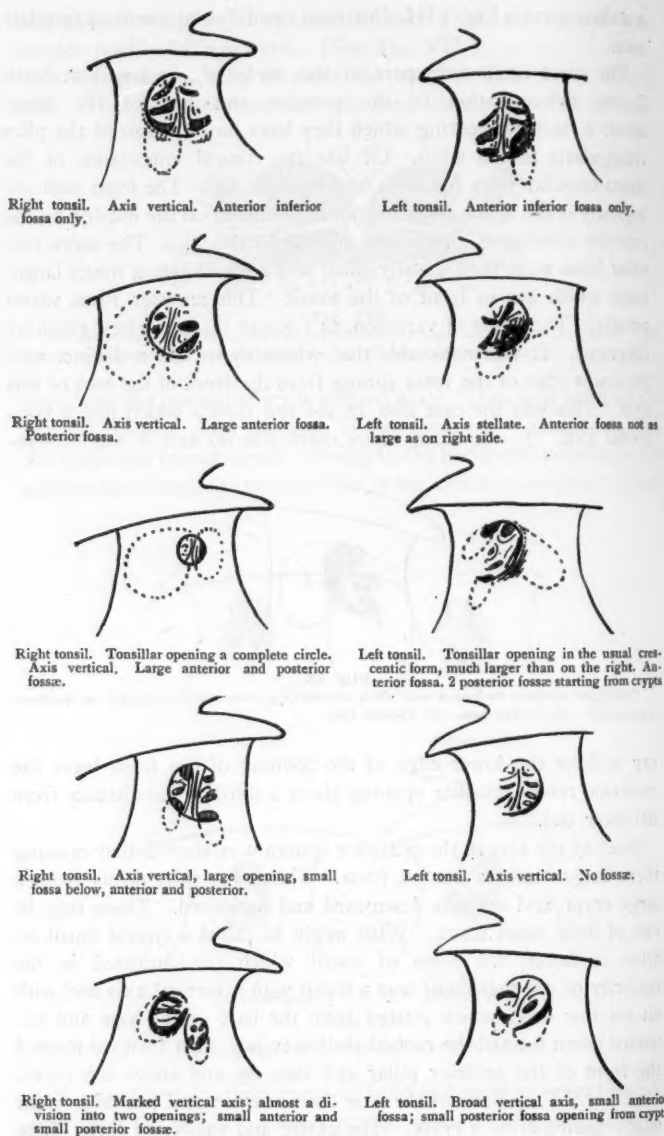


Fig. X.

The variations of the fossae about the tonsil.

The anterior fossa was present in almost all the specimens and was present without a posterior fossa in about half of the cases. It is on the presence of these two fossæ together and on their size that the form of the adult plica depends. If there is the usual large anterior fossa combined with a large posterior fossa when the growth of the tonsil is complete, there will be a sling-like plica all round the tonsil. If, on the other hand, there is no posterior fossa, or it is very small, the plica will extend only to the bottom of the tonsil. Those cases where the plica extends only part way down the anterior face of the tonsil are accounted for by the fact that there was a small anterior fossa originally.

Both the plica and the fossa made by it have reached their greatest size at or before birth. This is not so with the tonsil. The relative increase in size of the tonsil goes on for some years after birth. If, then, there is an anterior fossa which is deep enough to accommodate this growth, there will be a correspondingly large plica. On the other hand, if this fossa is small, the tonsil grows away from it, leaves the fossa above, and to a certain extent unbuttons itself from it. The resulting plica is as a consequence, small.

Fig. X., showing large and small fossæ, explains how this can happen.

The position of the plica triangularis in the adult is almost at right angles to its position at birth. If the pharynx is opened from behind and the tongue depressed, the tonsillar opening gaps and the plica spreads open, and becomes more vertical. This is what happens as growth goes on. The tonsil, the same as the face, grows downward. It also grows inward, and to a certain extent forward. In this way the plica is carried downward and inward and set in place by the growth of the tonsil much the same as the gib of a boat is filled out by the wind.

The clinical importance of the supra-tonsillar fossa comes from the fact that it contains tonsillar tissue which cannot drain properly, owing to the pouch-like shape of the fossa. At birth about a third of the tonsil is covered by the plica triangularis. If the plica is cut away, it is common to find at the base of the tonsil several large crypts hidden by it.

Fig. XI. shows the amount of tonsillar tissue which is usually hidden behind the plica.

The conclusions which may be drawn from the data here collected are: At birth, both the tonsillar fossa and the form of the tonsil itself are very variable. This is what one would expect after seeing the great diversity of the adult tonsil. Irregularity in the

closure of the tonsillar cleft accounts for the greater number of the variations, especially does it explain the occurrence of double or triple tonsillar openings. These multiple openings probably explain the lobulation of the tonsil into two or even three lobes. The tonsillar opening is found to be double in one-fourth of the cases. What might be called the typical tonsil has a vertical axis with an anterior fossa starting from the root of the axis and a posterior fossa which starts back of the axis from the opening of a follicle. The anterior fossa is practically always present. In about half of the cases the posterior fossa is absent. The extent of these two fossæ ex-



Fig. XI.

Showing the amount of tonsil covered by the plica (dark shading). In this specimen a marked fold, the remnant of the anterior edge of the tonsillar cleft, runs downward and backward from the tonsillar opening.

plain the size and the attachment of the plica triangularis on the adult tonsil, why in one case the plica extends only half way down the front face of the tonsil and why in another case it extends completely round the tonsil to the posterior pillar. The tonsil shares in the general downward growth of the face. At birth the tonsillar opening and the tonsil are practically horizontal. The tonsil at such a time is more a part of the palate than of the wall of the pharynx. Owing to the growth of the face downward the tonsil also grows downward, forward and inward. As a result of this the plica is carried from a horizontal to a vertical position. The supra-tonsillar fossa undergoes a like change of position.

ADENOID GROWTHS WITH SPECIAL REFERENCE TO ADULT CONDITIONS.*

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It is not the purpose of this paper to enter into any detailed account of the causes, pathology, symptoms, nor treatment of adenoid vegetations, but to bring to the minds of its hearers a few points of interest not hitherto dwelt upon at any length by those who have contributed to its literature. Brevity will of necessity be a virtue by reason of the lack of information available. A careful search through text-books and journals covering a period of twenty years gives us but little data touching the points we desire to bring to your attention. Not that what we may say carries with it anything new, but we hope to interest you in some phases of the subject that have not been deemed as important as we believe they deserve. The early recognition of this growth by the general practitioner claims especial emphasis. Not many years ago the family physician knew but little of this trouble. Children in countless numbers were brought to them exhibiting distressing symptoms, such as turbulent sleep, mouth breathing, contracted chest walls, middle ear abscesses, impoverished blood, and many other attendant ills without their being able to recognize the condition. To-day this state of affairs does not exist to such an extent. However, we believe that even now our younger members of the profession are not taught sufficiently well the importance of thorough examination in every case where the slightest possibility of this malady exists. When we look back over our early experience in epidemics of scarlet fever, measles, and diphtheria, and contemplate the many sequelæ we tried so hard to avoid, we cannot fail to appreciate our lack of knowledge and our causes of failure. Few of us, if any, ever thought of disinfected a naso-pharynx. Seldom, if ever, did we realize that in this locality were bred and cultivated the very germs of this wide-spread infection. It might be well to consider here the part played by the gland of the vault and oro-pharynx in the propagation of germ diseases occurring in childhood. Among the very first evidences of infection in any of the exanthemata are inflammations of the nasal and pharyngeal mucous membranes. Why then is it not reasonable

* Read before the American Laryngological Society, held at Washington, D. C., May 12, 13 and 14, 1903.

to believe that here exists the culture beds of these bacteria? If this be true, then might it not be possible to lend valuable aid in the prevention of these diseases by ridding the individual of the soil in which this infection is developed? In the light of our own experience we believe this can be accomplished. To state the point more clearly, we believe that the early recognition of these enlarged and pathological lymphoid glands, and their removal, will lend great assistance in the prevention of such diseases as measles, scarlet fever, chicken-pox, and we may add diphtheria and probably pneumonia.

If in our enthusiasm we have reckoned too far in what we have just said, we believe that every laryngologist will concur in the statement that most of the distressing middle ear sequelæ attending these diseases may be averted by proper attention directed to this locality. The general practitioner should carefully examine every child for adenoids whenever he has reason to believe they have been exposed to any of the diseases before named, and should insist upon their removal if present. This can be done without subjecting the patient to any danger so serious as would occur if left unattended. If this opportunity is not afforded during the period of incubation, then he should resort to proper cleansing and disinfection of the parts in the hope of preventing infection of the middle ear.

Another important point we desire to call to your attention, is the co-existence of enlarged faucial tonsils and adenoids in children. A careful examination of many hundreds of cases reveals the fact that with very few exceptions, where we found enlarged faucial tonsils there existed the same condition in the vault. Our records show but few exceptions, so few indeed that we are forced to accept it as the rule; on the contrary, we have seen many cases, exhibiting large pharyngeal hypertrophies with faucial glands very small if not entirely absent. An explanation of this may be founded on an embryological fact that the pharyngeal tissue develops first and arrest closely follows in the glands below. This might be of value to the practitioner if he would realize that the condition of the faucial glands is an index to what exists above. It would also guard against the oft-repeated neglect of removing what appears below as offending, leaving the real disturbance unattended.

We now come to a phase of this subject which we believe to be of great importance, viz., adenoids in adults, or more properly speaking, pathological conditions of the lymphoid tissue in the adult vault. It is our belief that the lack of proper diagnosis in those cases accounts for our lack of success in the management of many intractable diseases of the upper air passages and middle ear—indeed many persistent affections of the pharynx, larynx and bron-

chial tubes might find a remote cause in this condition. The oval-shaped fibrous mass at the junction of the occiput and sphenoidal body is too often overlooked or passed by as unoffending. Too often we fail to use our probe, that by using, we may find beneath this resisting cover, a mass of diseased lymphoid tissue, with pockets lined with pyogenic membrane, pouring out their material laden with all kinds of infectious bacteria.

Much has been written upon this condition in child life, but seldom do we find more than occasional mention of its existence in matured age. Delavan in an article appearing in the *New York Medical Journal*, Oct. 12, 1889, referred to cases he had seen that had persisted through childhood to middle life, and in some the hypertrophy had apparently developed after puberty, especially in women of stout figure who had suffered from catarrh of the upper air passages and dyspepsia. He observed that singers were especially liable to this condition. W. Meyer in his analysis of 102 cases, found but eight affected after the twenty-fifth year. Bosworth found but four after the thirtieth year in seventy-five cases reported.

Hallat reported a few cases in adults between the ages of eighteen and twenty-five years, and suggests that in a great many cases over twenty years of age there are adenoids that require operation.

At a meeting of the French Laryngological Congress in 1890, Raulin of Marseilles called attention to the existence and relative frequency of adenoid growths in adult age, and we ask the indulgence of our hearers while we quote at length the report made of his remarks by the *Journal of Laryngology and Rhinology* in the July number of that year.

"Observed in persons of forty, fifty, sixty and even of seventy years, they date generally from childhood, as is proved by recollection, osseous deformity of the head, and by the chronicity of the trouble of hearing. Formed most frequently by the hypertrophy of a single group of closed follicles—it may be of the pharyngeal tonsil or of that of the fossæ of Rosenmüller—these tumors are surrounded by traces of their congeners, which have not escaped as they have, atrophy and retrogression. The symptoms are of little importance; respiratory troubles are absent, or, if present are due to the passive congestion of the cavernous tissue of the turbinated bones. The patients complain, in the majority of cases, either of naso-pharyngeal catarrh or of deafness. This last symptom is in no way influenced by the destruction of the growths, on account of the long continuance of the lesions of the middle-ear. The most advantageous treatment is by removal with different kinds of adenotomes; ablation is more completely effected than with the forceps, with which it is not pos-

sible to seize the more or less atrophied remains of growth which surround the tumor."

Haight of Chicago, in a paper read before the sixth International Otological Congress in London, Aug., 1899, entitled, "Naso-Pharyngeal Adenoids as a Causation Factor in Ear Diseases," stated that he had operated upon patients over sixty years of age, and had often removed them in patients between the ages of thirty and forty years.

Careful search through the literature on this subject covering a period of over twenty years, fails to find more than a passing notice, suggesting always that such conditions are very rare and bearing little clinical importance. In the experience of the writer the reverse condition predominates. The child may pass through its early life carrying with it the many ills attendant upon an overcrowded vault, without results so serious as to endanger its life, or subsequent usefulness. With all of these, and more, are the ills of those who have suffered through infancy, youth, adult life, and even to old age. Were we to enter into a detailed account of the cases we herein report, it would unfold history of great suffering, great privation and much mental anguish. We have in mind a fair example in a man who consulted us. He gave a history of repeated attacks of middle ear inflammation in childhood—difficulty in breathing, inability to obtain an education in keeping with his ambition, gradually increasing deafness with every cold. At the age of twenty he sought medical attention, and so continued with varying success until he had about given up all hope of relief. At the time of his visit to us, his condition was as he remarked "unbearable," unable to attend to his business, stayed away from his friends, cared not to attend a theatre or church, in fact never thought of going to such places. Examination revealed no watch hearing except when placed on mastoid. Every test negative save bone conduction. Distressing tinnitus at times—not constant—marked retraction of drumheads, ossicular chain crowded high into the attic, thickening and evidences of old inflammation in Schrapnell's membrane—beginning evidences of labyrinthine tension. Examination of the nose and naso-pharynx proved this to be the evil cause. With hypertrophy of all the turbinal bodies, and a vault filled with a large mass of lymphoid and fibrous tissue, you will all agree with me that this was not, to say the least, a promising case for prognosis. After performing the various necessary operations, and conducting a treatment consisting of Eustachian catheterizations, bougies, and aural massage, etc., through a period of nearly three years, we are glad to report that this patient is able to conduct his business with comparative comfort, and can hear ordinary conversation at a fairly long range. Other

histories might be recited that were just as unfavorable, and just as interesting; some in which results were most gratifying, while in others our efforts were without appreciable avail. An interesting question just here suggests itself—Do pharyngeal tonsils when once pathologic, tend to atrophy? The history of all these cases herein reported, brought out the fact of difficulty more or less severe, beginning in early life. Most every case dated back to measles, scarlet fever, small-pox, or diphtheria as the occasion of greatest severity.

In the light of our experience, we believe that when once this tissue becomes diseased, it rarely atrophies. It may and does diminish in size in many cases, but whenever established as a diseased process it seldom disappears except by removal. To define our position more clearly, if the child in whom hypertrophies on the vault exist is the victim of any pathological process sufficiently severe to establish trophic changes in the structure of the gland, then there is little likelihood of its disappearance at puberty. To draw conclusions more closely, we believe that in nearly every case of hypertrophied vault tissues where measles, scarlet fever or diphtheria has intervened, we will find evidences of this hypertrophied gland in adult life. From clinical experience we are constrained to differ with those who believe that these conditions begin in patients of mature age. In none of the cases under our observation have we ever failed to obtain a fairly definite history of early involvement.

Of the sixty-five cases we have to report, thirty-five were males and thirty were females. Thirty-two occurred between the ages of twenty-five and thirty-five years. Twenty-nine between thirty-five and forty-five, and four between forty-five and fifty-two years. Fifty-four had co-existing nasal hypertrophies of varying severity. Three had atrophy of nasal membrane. In two the atrophic process was found in both nostrils; in one it existed only upon one side—the left. It is interesting to note that in this case last mentioned, the vault tissue appeared as a cicatricial mass with a band of adhesion extending from the fossa of Rossenmuller to the posterior Eustachian lip. The patient exhibited marked deafness in the left ear, greatly in excess of that existing in the right. Removal of this scar tissue brought about a noticeable improvement in hearing power.

Forty-seven of the sixty-five suffered from some form of middle ear disease. Nine exhibited chronic suppurative otitis media in one or both ears. Twenty-three had had recurrent attacks of acute catarrhal or suppurative otitis media. Twenty-two showed progressive deafness dependent upon sclerotic changes undergone in the conducting media.

The results obtained in a large per cent. of these cases were not in keeping with the statement of Raulin, who said that the deafness

attending these growths was in no way influenced by their removal. Three of the nine cases of chronic suppurative otitis media were relieved without additional operative interference directed to the ears, other than proper attention to cleanliness by antiseptic irrigations and such measures as would establish thorough drainage and ventilation of tympanum. Four were benefited to the extent that recurrent attacks of suppuration have been very infrequent, appearing only during acute inflammation of nasal and naso-pharyngeal mucous membranes. In two the aural conditions were of such severity that removal of the pharyngeal growth was performed only to further aid the results to be obtained from a complete cleaning out of the contents of the middle ear. Of the twenty-three cases with recurrent acute attacks of catarrhal and muco-purulent inflammations of one or both ears, twelve, or about fifty per cent., have had as yet no subsequent return, and the existing deafness improved in degree proportionate to the amount of permanent injury to the affected organs. In the twenty-two exhibiting sclerotic changes in the conducting media, our results were less gratifying. These cases are usually of such long standing, and degenerative process so extensive, that but little improvement results from any line of treatment.

Notwithstanding the fact that an unfavorable prognosis in these cases must be made, nevertheless it is our duty to rid the sufferers of these disturbances in the hope of arresting the progress of their unfortunate disease.

We ask your further indulgence while we summarize the points desired to be brought out by this paper.

First.—The early recognition of adenoid growths in children by the general practitioner.

Second.—Prompt removal when so extensive as to interfere with the development of the child, and especially when the patient has been exposed to any of the exanthemata.

Third.—When present in patients suffering from the above eruptive diseases, attention must be directed to proper disinfection of the pharyngeal vault.

Fourth.—*In patients exhibiting enlarged faucial glands there generally exists hypertrophies in the vault*—the reverse condition does not always obtain.

Fifth.—That hypertrophies of the pharyngeal glands in adults is *not* a rare condition, and that as a rule it is dependent upon pathological changes during childhood, and not developed after puberty.

Sixth.—That operative interference is warranted in every instance not only to relieve existing dependent conditions, but to prevent impending complications.

GANGRENE OF THE TONSIL.*

BY CHARLES W. RICHARDSON, M.D., WASHINGTON, D. C.

Gangrenous destruction of the tissues of the fauces is of such an infrequent occurrence that I thought such a case worthy of presentation before this association.

In looking over the literature on gangrenous destruction of faucial tissue, excepting of diphtheritic origin, I find an unusually small number recorded. In my experience this, the case which I now report to you, has been the first which I have ever seen.

On March 1st I was called in consultation to see a patient residing about nine miles from Washington. It was late in the afternoon when I reached the patient's house, and was nearly an hour later before the consultants were with me.

On the presentation of the case to me by one of the consultants, and carefully going over the history and the temperature sheets, I could see at once that the case, whatever might be its cause, was one of extreme sepsis. The history as presented to me is as follows:

The patient was a man of robust physique, of forty-five years of age, addicted to excesses. About ten days before, he had returned from a trip to the North, at which time he had been using alcoholics to excess. When he first came under the observation of the physicians in charge, he had considerable difficulty in swallowing, marked infiltration of the right side of the neck, with other characteristic symptoms of quinsy. In a couple of days it was stated that the patient had a discharge of pus from the nose and mouth, with which there was a subsidence of the swelling in the right side of the neck, a restoration to the normal voice, no further difficulty in deglutition, and the restoration of the ability to open the mouth freely and widely. About two days thereafter, the physician in charge saw what he supposed to be some white spots on the right tonsil. He then thought that the case was probably one of diphtheria, although there was a doubt in his own mind. Nevertheless, the next day he administered 3,000 units of antitoxin. On the second day thereafter, there were 3,000 more units given, and between that and the day I saw him, he received, in all, 16,000 units of antitoxin.

* Read at the Twenty-fifth Annual Congress of the American Laryngological Association, held at Washington, D.C., May 12, 13 and 14, 1908.

Even under this repeated use of antitoxin, there was no improvement in the patient's condition. He gradually, but progressively, grew worse. On the ninth day of his illness the patient became delirious, and on the tenth, and last day, I was called in consultation.

At this time, the patient's temperature was 102; his pulse 120, soft and compressible, and he was in a muttering delirium. On inspection, which was comparatively easy for one in a delirium, and in such a serious condition, I was first struck by the absence of the characteristic diphtheritic odor of the breath, and was impressed by the peculiar odor which is due to sloughing tissue. On depressing the tongue, I was quite unprepared for the sight which I observed. On the right side, the tonsil, the anterior and the posterior pillar, and as far down in the pharynx as I could see, was one continuous mass of greyish, brownish slough. The left side and the curtain were perfectly normal. I particularly noticed the fact that there had already formed a complete line of separation between the necrotic and the normal tissue. The examination was prolonged until a careful and thorough inspection was made of the diseased area, and both the consultants had examined it with the same care. On consideration of the case, they both told me that the first they had noticed of the sloughing was the day before when there was a narrow white line of diseased tissue, but, from the complete line of separation, I was rather inclined to believe that their examination was not as perfect a one as had been made by me. The patient was in extremis and died two hours after I first saw him.

In consideration of this case, as to its nature and the cause of the gangrene, there are several interesting points to decide. The long distance from the city, the tedious trip out and back, made it impossible, on account of want of facilities, to do anything in a bacteriological way. I was, unfortunately, not supplied with culture tubes or glasses to make smears. This, of course, makes the case rather incomplete as to its bacteriological study. Unfortunately, our consultants had made no bacteriological examination for the bacilli of diphtheria; but from the fact that antitoxin had been so inefficacious, and from the clinical history of the case, I think we can exclude the possibility of diphtheria playing any role in regard to its etiology.

Of course, not having made any smears, it is impossible to exclude the spirillum as an etiological factor, but the amount of destruction, the extent of destruction, and the depth of the necrotic tissue would seem almost to exclude this possible origin. If it

were a case of spirillum infection, it was certainly a most marked manifestation of this condition.

It seems to me that the most possible and plausible origin of this destructive process is as follows:

In the first place, the patient evidently had a quinsy, which was attended with considerable infiltration of the peritonsillar tissues, the infection being due, in all probability, to the streptococcus. This invasion being of such an intense nature, it resulted in the gangrenous destruction of the surrounding tissues. It is also possible that the invasion and raising of the tissues, due to the accumulation of pus, had caused an occlusion of the tonsillar and ascending pharyngeal arteries, thus adding to the impairment of the nutrition of the tissues and allowing the infected agents to more thoroughly do their work.

Arguments Favorable to the Specificity and Contagion of Atrophic Rhinitis; Six Cases in One Family; Prophylaxis and Treatment of Ozaena.—M. L. VAQUIER—*Archiv Internat. de Laryngol. D'Otol. et de Rhinol.*, No. 6, Nov.-Dec., 1902.

The author reports six cases of ozaenæ which made its appearance in the children of one family.

Vaquier claims that osseous atrophy is secondary in such cases. Michel, of Cologne, believes in a preceding sinusitis; Cozzoline that scrofula plays an important pathologic role. Vaquier thinks that such theories ought to give place to the microbial which explains better the transmission, that is to say, the contagion.

The microbe of Lowenberg-Abel is well known. Perez describes the bacillus fetidus ozaenæ, which has a special predilection for the mucous membrane.

Vaquier believes in the specificity and contagiousness of ozena and from this theory gives his directions as to prophylaxis; not to let children sleep in the same bed with affected cases; limit the use of handkerchiefs; disinfect linen, towels, etc., that may be infected; examine the nurses.

The treatment consists in stimulating the mucous membrane; spraying with silver nitrate solutions, hot nasal douches, either simple or medicated, followed by medicated vaseline to the mucous membrane. The use of serotherapy, vibratory massage, electrolysis and even thermal baths.

The method of paraffin injections practiced by Dr. Moure is also useful.

W. SCHEPPEGRELL.

A SYNOPSIS OF MY FIRST HUNDRED MASTOID OPERATIONS.*

BY C. BARCK, M.D., ST. LOUIS.

Although larger statistics have been published, it is at times beneficial to review the subject from the standpoint of personal experiences. These cases form a continual series, operated within the fourteen years from March 1887, to January 1901. Most of them were patients in private practice, and the majority were operated in residences, the others in hospitals.

STATISTICS.

Of the 100 cases, 91 recovered and 9 ended fatally.

There was a slight preponderance of the left side over the right, the left being affected 51 and the right 49 times.

The ages varied from 4 months to 63 years; 42 were below the age of 15, among them 5 babies.

Two cases were "primary" mastoiditis, without previous involvement of the middle ear.

Bezold's form was encountered twice.

Cholesteatoma was found in 5 instances.

Caries with exfoliation of the entire labyrinth occurred once.

For osteo-sclerosis one operation was performed.

Subperiosteal abscess was present at the time of the operation, 14 times.

Facial paralysis was met with in 5 cases.

The healing process required 4 weeks in the shortest instance, and nearly 6 months in the longest.

Subsequent operations became necessary in 6 cases; a second in 4, and a second and third one in 2.

Erysipelas followed the operation twice, both cases ending in recovery.

The intracranial complications were as follows:

Subdural abscess, 2.

Sinus thrombosis, 5.

Brain abscess, 3.

Meningitis, 4; among them 2 were tubercular.

In one of the above cases there was sinus thrombosis and cerebellar abscess present.

* Read at the Eighth Annual Meeting of the Academy of Ophthalmology and Oto-Laryngology, held at Indianapolis, Ind., April 9, 10 and 11, 1903.

Of the nine cases that ended fatally, none died from the effects of the operation; all of them were cases with intracranial complication. The latter were: Sinus thrombosis twice, once complicated with a deep cervical abscess. Osteophlebitic pyemia without sinus thrombosis, once. Abscess of the brain, twice. Meningitis, four times.

A number of these cases were seen in the eighties, before the era of intracranial surgery for ear complications, which has developed since 1890, and therefore no attempt was made to go beyond the mastoid proper. In five of the nine cases a post-mortem was held by me. At the end of the article will be given a report of the cases with intracranial complications, both the fatal ones and those which recovered.

The affections of the babies (below one year of age) were all acute cases, most of them robust children otherwise. All made a quick recovery, and the after-treatment was less unpleasant than expected.

In the two cases designated as "primary mastoiditis" the closest examination failed to reveal the presence of an otitis media. In both, the abscess was located in the outer mastoid cells; the antrum was opened, but found intact. These cases might be classed as osteomyelitis of the temporal bone.

The percentage of Bezold's form seems to correspond to the experience of others. That the drainage in these cases is difficult, is well known.

The five cholesteatomata form a small percentage, whilst they form a considerable one in European clinics.

The case of caries with exfoliation of the entire labyrinth was reported in full at the meeting of the American Medical Association at Milwaukee, in 1893.

A typical instance of "osteosclerosis" was met with once. A lawyer from Kansas had had an acute suppuration of the middle ear several months before he came to St. Louis. According to his statement, the mastoid region was at one time tender on pressure and somewhat swollen during the height of the otitis. Although the latter healed under treatment by his physician, a severe pain in the mastoid region had persisted. This was constant, robbed him of sleep, and caused in time a severe melancholic depression of mind. On his arrival, I found the tympanic membrane normal, with the exception of a cicatrix. Hearing nearly normal. No swelling, no redness, no pain on pressure upon mastoid; only the mentioned severe neuralgia. The diagnosis "osteosclerosis" was confirmed by the operation. The entire mastoid was eburnised,

with a minute antrum left. The operation gave immediate and permanent relief. This coincides with the experiences of others.

Of the five facial paralyses, two were present when seen for the first time. One of these recovered entirely within one year; the other one improved slowly. The patient was a boy of four years when operated in 1889, and now at the age of eighteen shows hardly a trace. The third occurred in the case of caries just mentioned, during the period of exfoliation of the sequestrum. The paralysis was quite a complete one for some time; gradually the upper branch, controlling the orbicularis muscle, regained its power, so that the eye can now be closed nearly as well as the other. The lower branch, however, shows a considerable paresis still. The fourth and fifth cases were due to operative procedure. One was a mild paresis, after the evacuation of a subdural abscess. Contrary to expectations, it receded very slowly, and now, after the lapse of over two years, the last remnants show themselves at the angle of the mouth, during the act of laughing. The other occurred during the second operation for a large cholesteatoma with cerebral symptoms, performed after the radical method. The palsy was total for some weeks; then the upper branch recovered slowly, so that the eye can be closed now with an effort, while the lower part of the face of that side is still, after six years, nearly entirely paralyzed. I have dwelt at length on these cases and their course, because all of them have been seen at intervals up to now, a rare occurrence, as they are usually lost sight of.

I have not included among the foregoing, an instance of facial paralysis, where an erroneous diagnosis was made as to its cause. There was present a chronic otorrhea and facial paresis, but no tenderness or swelling over the mastoid. It was supposed that a carious process in the neighborhood of the Fallopiian canal caused the affection of the nerve; the mastoid was opened but found intact. The patient died about half a year afterwards and the post-mortem revealed sarcoma of the brain. The paralysis had been a central one.

By "subsequent" operations I do not understand the repeated scraping out, removal of sequestra, etc., before the closure of the primary wound, but instances, where the patients had been dismissed and returned years later with a mastoid affection of the same side. Apropos to this I would like to report a rather remarkable history.

A. S.—The girl was first seen, when 9 months old, on March 20, 1892. After an otitis media of one week's standing, a typical mastoiditis had developed. As it did not recede under the usual methods, I operated on April 3, 1892. Small amount of pus and

detritus, mainly in outer mastoid cells. The healing was normal, the wound was closed on May 23, 1892. The discharge from the ear had ceased prior to that. The child was in perfect health during the next three years.

In March, 1895, an acute otitis developed in the same ear. In spite of an immediate paracentesis, the mastoid became involved again very rapidly, and was opened the second time on March 28, 1895. Again normal healing. Suppuration from the middle ear ceased about May 15; mastoid wound was closed on June 2, 1895. Hearing, just as good as on the other side. The child was robust and well developed. It was seen at intervals and the ear as well as the mastoid remained in good condition for the next 4 years.

In April, 1899, the course of 1895 repeated itself. Earache for just one night. When I was called the next morning, I found the symptoms of an otitis media and the old scar on the mastoid already somewhat red. In spite of an immediate paracentesis, the mastoid symptoms developed so rapidly, that I had to open it for the third time on April 9, 1899. A small amount of fluid pus was found, besides granulations and cheesy masses. The cavity was cleared with the utmost care and every focus of softened bone was curetted. The detritus removed was sent to a bacteriologist to be examined for tubercle bacilli. He reported a negative finding. The wound was again closed June 22, 1899, the otorrhea having ceased. Hearing about 2/3.

In May, 1900, the family desired to make a trip to Europe, and brought the child to me a week before their departure. It was in very good general health, mastoid perfectly sound; drum membrane of normal appearance, hearing about as good as in the other. Therefore, I saw no reason why they could not take the child along. After being six days on the ocean, the same course as in '95 and '99 took place. When they arrived at Bremen, they consulted a physician at once, who advised them to proceed to Berlin. There the child was operated immediately by one of the foremost specialists, but died 3 days later. According to the history given by the father, infective lateral sinus thrombosis was the cause of the fatal end.

There is still doubt in my mind, whether or not this case was of a tuberculous nature. The negative findings of the carious masses mentioned, does not, of course, exclude it. At one time, during '99, there was some cough and the family physician diagnosed an infiltration of the apex of the right lung. The examination of the sputum, however, also proved negative, and the cough ceased entirely after several weeks. There is no tuberculosis in the family

of the father and a very distant one in that of the mother. The other two children of the family are perfectly healthy.

In the two cases, where erysipelas followed the operation, the latter had to be performed in a hurry, in private houses, and with unclean surroundings.

The histories of the 14 cases of intracranial complication are as follows:

The two patients with "subdural abscess" recovered. In one of them, an intracranial affection was suspected, in the other it was found unexpectedly.

Case 14.—M. R., æt. 63. Very violent otitis media but with spontaneous perforation. When seen several weeks later, he presented the typical symptoms of an acute mastoid abscess and was in a comatose condition. The hearing in the affected ear apparently entirely gone. No changes in fundus of either eye. Operation next day. External shell of bone 4 mm. thick and very dense. Antrum filled with pus. Tegmen antri greenish, discolored and partially destroyed. Above it, an abscess cavity, $1\frac{1}{2}$ cm. in diameter. Clearing; regular recovery.

Case 93.—A. O., æt. 35. Chronic otorrhea of about 15 years standing. Middle ear filled by granulations, and chronic mastoid affection, but no cerebral symptoms. The operation revealed large destruction of the bone, close to the lateral sinus; and the tegmen antri wanting to a large extent, especially in the direction of the tegmen tympani. A subdural cavity contained nearly a teaspoonful of exceedingly fetid pus, which caused suspicion of a cerebral abscess, but careful probing could not detect a perforation of the dura mater. During the healing process, a portion of the bone around the Fallopian canal became necrotic, and its extraction was followed by a mild facial paresis, with a very slow recovery, as stated above.

Of the five cases classed under the head of sinus thrombosis, one which was not operated upon, ended fatally. This was rather an instance of otitic pyemia as there was no thrombus found in the sinus at the post-mortem. (Case 43.) The other four were operated upon, and two recovered. Of the two which succumbed, one was operated at too late a stage, and the other one died really from an unrecognized deep cervical abscess.

Case 43.—J. R., æt. 23. Influenza and pneumonia for three weeks. The right ear had been running for a short time before the influenza set in (possibly the first localization of the disease). During its course the left ear began to discharge also. As there had never been any pain in the right ear, there was no particular atten-

tion paid to it until mastoid symptoms had developed. When seen in consultation with the family physician, the mastoid region was red and edematous. The upper posterior wall of the external canal was sagging to such an extent that the swelling closed its lumen nearly entirely. Severe pain in mastoid region and the entire head.

Operation next morning. Bone sclerosed; outer shell exceedingly hard and dense. No cavities until the antrum was reached. In this fluid pus was encountered and a communication was found connecting with the abscess cavity projecting into the external auditory canal. Free communication with tympanum.

For the first three days, the course was a good one. Free from pain. Temperature fell below 100° F. Was sitting up on the second day.

On the fourth day he had a chill. Temperature rose to 104° F. Wound carefully inspected without unusual findings. Temperature fell and was normal after 36 hours. It remained so for the next 5 days, then another sudden chill took place, the temperature rose to 104 2-3° F. in two hours, accompanied by profuse sweating. During the next few days, the temperature did not sink below 102° F., frequent chills and vomiting. For the last two days severe pain and some swelling in left shoulder joint and elbow joint. Patient grew weaker and weaker and died two weeks after operation.

Autopsy—Entire temporal bone removed. No thrombus in lateral sinus. The blood in it was fluid, but mixed with some minute particles of pus. The bone separating it from the wound was in its thinnest part 2 mm. thick, dense, and healthy looking. The entire petro-mastoid bone was of hard, ivory like consistency, but traversed by a number of wide veins filled with fluid pus. Contents of the cranial cavity normal. In this instance, an opening of the sinus could hardly have saved the patient.

The next two cases have been published in my article, "Two Cases of Opening of the Lateral Sinus for Infective Thrombosis," with a table of operations performed previous to 1897. (*Annals of Otol.*, etc., 1897.)

Case 45.—J. K., æt. 26. Hungarian by birth. Patient had since childhood, left-sided otorrhea, the cause of which was unknown to him. No treatment had been resorted to, as he experienced no pain. Three years ago he was seized with a very violent pain in the ear, for which he was treated by a specialist for about four weeks. Since then, a somewhat fetid discharge has persisted, but no pain until recently.

Patient first consulted me on January 15, 1894, because of pain in the ear for three or four days preceding. He is of medium size and

fairly well nourished. Right ear normal. Left ear, foul smelling discharge in moderate quantity. After cleansing, the walls of the external canal were found to be somewhat swollen, the tympanic membrane gone, and the middle ear completely filled with small polypi and granulation tissue. The region over the mastoid showed no swelling, but was somewhat tender on pressure. Temperature 100° F.

In consequence of careful cleansing with antiseptics for about a week the pain subsided, and the temperature fell to normal.

I then removed two of the largest polypi with the snare; but finding the entire middle ear filled with granulations, proposed an evacuation of the cavities by an operation through the mastoid. As the patient felt very well at the time, he declined, and I saw him only once or twice within the next two weeks. On February 17, I was called to see him at his residence. He was confined to bed, complaining of severe pain in the entire left side of the head. He had had chills and rigors for two days, and had vomited two or three times. Temperature 100, pulse 100. The region over the mastoid was somewhat swollen, and the tenderness on pressure was more pronounced. I informed him that an operation was urgent, and sent him to the hospital the same afternoon.

Operation, (Stacke's), February 18th.—Immediately after the removal of the external table, fetid pus was found. The antrum was exposed, and found filled with granulation tissue and pus. A portion of the posterior wall of the external canal was then removed, so that the canal, antrum and tympanum formed one large cavity, from which the foul smelling pus and abundant granulation tissue were carefully removed. Only small portions of the ossicles remained. The tegmen tympani and antri were found healthy, but the bone in the region of the lateral sinus seemed somewhat discolored, so that I stated at the close of the operation that, if the symptoms did not subside rapidly, opening of the sinus would be indicated.

After the operation the patient felt relatively well and the temperature did not reach 100°. However, during the next two days it rose to between 103 and 105, the pulse varying between 80 and 112.

He complained of headache and had a chill. There was no paresis nor any material change in the fundus of the eyes. The general condition and curve of temperature were typical for systemic pyemic infection. Therefore,

Opening of the lateral sinus, February 21, in its sigmoid portion, from the cavity in the mastoid. An oblong piece of bone, (discol-

ored as before described) nearly one inch long and one-third of an inch wide was removed by careful chiselling and forceps. Some pus and granulations were found between it and the exposed wall of the sinus, which was also discolored. The sinus was then punctured with an exploring needle and found thrombosed. An incision in its wall, as long as the opening in the bone was then made, and a large softened purulent thrombus removed. The cavity was then gently cleansed with a blunt spoon as far as practicable, first downward, then upward. There was no hemorrhage from the lower, and only a moderate one from the upper end. As soon as this appeared the sinus was closed by compressing its walls with antiseptic gauze and the hemorrhage easily checked.

Subsequent course—The expectation of checking the further infection of the system was not realized. While on the next day he had no chills (temperature below 100), and felt some better, on the following day he became worse, the symptoms beginning with a chill. The temperature again rose to 104.2-5, pulse became frequent, pain appeared in different joints, and, in short, he presented for the next two days the typical picture of an even more serious pyemic infection.

The area over the jugular vein on the neck had been regularly examined since his entrance into the hospital, but it was never painful, and no thickening nor stringiness indicating thrombosis of the jugular vein could ever be detected. For the continuance of the septic state there seemed to be but one explanation, viz., that the septic thrombus had already reached the bulb of the jugular, and had not been entirely removed. It was accordingly decided to ligate the jugular vein, an operation which was done by Dr. A. C. Bernays, on the 24th. The vein was filled with normal blood; no sign of thrombosis. It was ligated in two places and cut between the ligatures.

The ligation did not have the desired effect, as the pyemic state continued. Frequent and profuse perspirations, pain in the joints and high temperature weakened the patient more and more. He became delirious, then somnolent, and finally fell into deep coma, and exitus letalis ensued on the 15th of March. The temperature during the last two weeks ranged between 101 and 105, pulse between 110 and 130.

The wound in the mastoid and sinus was throughout in the normal condition of an undisturbed healing process.

Post Mortem—The skull was opened in the usual way. The contents did not present any pathological appearance, and the brain was intact. There was no lepto-meningitis, nor any trace of pachy-

meningitis. The dura mater covering the temporal bone was perfectly normal throughout. The inner wall of the lateral sinus in its sigmoid portion was of normal appearance, half transparent, so that the defect in the bone due to the operation could be plainly seen through it. Upward, in its horizontal portion, the sinus was closed for about one inch, its walls being *soldered*, as it were. Downward, in the end of the sigmoid portion, it was patent for about half an inch, but further down it was firmly soldered. The jugular vein between the bulbous and the ligature was filled with a healthy thrombus which showed no disintegration, and which was without doubt the consequence of the ligature. No thrombus was present in any other of the dural sinuses. Thus far, the post-mortem findings did not offer any explanation for the continuance of the pyemic state after the two operations and the conclusion arrived at at this time was, that the infection had become too general to be overcome by obliteration of its foci. And it was rather accidentally, than otherwise, that the true cause was discovered. Owing to the pressure of time I did not at first intend to remove the temporal bone in order to preserve the specimen, but afterward decided on doing so, and during this procedure, after the big muscular layers on the posterior portion of the neck had been divided, we found a large abscess under the deep fascia of the neck below the splenius capitis and levator scapulæ in the posterior cervical triangle. The abscess contained about two tablespoonfuls of exceedingly fetid pus. The digastric fossa was free from pus.

About an inch and a half upward, direct communication could be traced between the abscess and the lateral sinus through a very large mastoid foramen. This abscess was without doubt the cause of the continued pyemia and fatal termination. No symptoms pointed to its existence during life. No redness, no swelling, no pain in the region. There is no doubt that its recognition and surgical treatment would have saved the life of the patient. Not as an excuse, but simply as a matter of fact, I will state that the patient had been seen daily, not only by myself, but by the aforementioned surgeon, and also by one of the most careful diagnosticians in our city. In spite of repeated consultations, the real focus of the pyemic infection was not discovered until the post-mortem examination and even then was almost overlooked.

Case 52.—Geo. G., aged 26. Fell from a wagon, striking upon his head, on May 3, 1895. He at once became unconscious and was removed to the city hospital, where he lay in this condition for three days. His right foot, both hips, and the right side were bruised. A superficial scalp wound running longitudinally for about an inch, was

found, one and one-half inches above the right auricle. There was considerable hemorrhage from the right ear, which continued for a week and a half. The wounds were dressed and healed. The ear was cleansed with hydrogen peroxide and the patient dismissed from the city hospital on May 24.

When he had arrived home, he complained of dizziness, and acted and spoke in a manner indicating to his relatives that he was anything but well.

I first saw the patient on the following day, and found the condition present as follows: Patient felt dizzy, his sensorium was benumbed, answered slowly, and sometimes not at all. No difficulty in articulation. No paresis nor paralysis. Had had a rigor and chill the day before, and one that day. Temperature 102, pulse 106. There was a fetid discharge from the right ear. The walls of the external canal were so swollen, especially the posterior and upper, that no part of the tympanic membrane could be seen. The auricle projected outward and there was considerable painful edematous swelling over the mastoid region.

Diagnosis:—Fracture through temporal bone and tympanum, otitis media, and secondary infection of fracture-line from the otitis.

Operation May 26th.—The fracture-line in the squamous portion of the temporal bone was easily visible after detachment of the periosteum, passing from behind forward and downward. Directly below the outer lamella of bone, and in the line of the fracture, there was an abscess as large as a bean. The antrum was found free. After cleansing of the cavities, some pus was noticed oozing slowly through a fine opening in the posterior wall of the cavity, which separated this from the lateral sinus. The bone was removed, a piece about three-fourths of an inch long and one-third of an inch wide. The wall of the sinus presented an irregularly oblong opening. I am unable to decide whether this was due to a violation during chiselling, or to the fracture. No hemorrhage ensued, as the sinus was filled with a thrombus. The opening in the wall of the sinus was enlarged, and the thrombus, which was softened and covered with pus, was removed. A small hemorrhage resulted. After a careful cleansing upward and downward with a blunt spoon, the walls of the sinus were compressed with gauze.

May 27. Patient had had no chill, was more rational, but still somewhat drowsy. Temperature below 100 since operation. Pulse never over 88.

June 1. Temperature rose, for the only time during after treatment, to 103 3-5, but fell rapidly after change of dressing. The recovery was otherwise an uninterrupted one. The patient became

perfectly rational four days after the operation. The wound was closed and the patient dismissed on June 26.

The discharge from the ear had ceased, and the perforation in the tympanic membrane had closed prior to that date. Hearing one-half at dismissal.

Patient has been recently heard from, and is and has been perfectly well since the operation.

Epicrisis.—Case 45 has been reported so minutely, because it is very instructive, and little needs to be added. Whether or not the destructive process had invaded the lateral sinus at the time I proposed the evacuation of the mastoid cavities, and whether or not the fatal termination could have been prevented by an operation at that date, is of course an open question. It would have been more advisable to open the sinus at once after the mastoid operation, and I shall certainly proceed on that line in future cases.

The other case is interesting on account of its course. The fall caused a fracture of the temporal bone, extending near or possibly into, the lateral sinus, and also ruptured the tympanic membrane. The open tympanum was not protected sufficiently, and infective suppuration set in. From this focus the infection spread along the fracture-line, causing there at one point a small abscess, finally reaching the sinus.

Case 78.—S. S., æt. 37. Since childhood, otorrhea in right ear. Seen first in November, 1898. Profuse fetid discharge. Middle ear filled with granulations. Severe headaches and dizziness for two weeks. Staggered slightly and was not able to walk straight. Mastoid region slightly swollen and tender on pressure. Advised an immediate operation, but patient did not return.

On February 22, 1899, was called to the hospital to see patient. He had been treated in the meantime at a dispensary, and had been able to work from time to time. For the last two weeks, he had been confined to his bed.

Patient was very weak and emaciated, and presented the typical picture of pyemia. Temperature over 104° F. Profuse sweating. Severe headaches in occiput. Cough. (House physician found consolidation of a part of the left lower lobe of the lungs.)

Operation next day. After cleaning the mastoid and middle ear (Stacke's operation), the sinus was laid bare by an oval opening, about one cm. in length. The bone covering the sinus was discolored and disintegrated. The sinus seemed to pulsate at times. Of two explorative punctures, the first was negative while the second drew pus. The opening in the bony wall was then enlarged by the forceps to 35 mm. and a corresponding incision was made into the

membranous wall. The sinus was filled with a fetid, decomposed clot. It was cleared upwards until free hemorrhage ensued; then downwards into the bulb of the jugular vein. Moderate hemorrhage from this side. As there had been no indication of involvement of the jugular vein, it was not ligated.

The progress was a favorable one for the following three weeks. He had no chills any longer, and not much pain. The temperature fell to normal. Then secondary abscesses commenced to develop on cheek and neck, one after the other. At the same time, there was a severe pain on the vertex of the skull in an antero-posterior line, spontaneous as well as on the slightest touch. The diagnosis of involvement of the longitudinal sinus was made. Chills became more and more frequent, temperature remained a constantly high one; cough increased considerably and finally a comatose state developed which ended fatally 5 weeks after the operation. No post-mortem permitted.

Case 94.—L. A., plasterer, æt. 55. Was seen on Oct. 17, 1900. He gave the following history: Otitis in May. Pain in ear, then running. Went to a dispensary for four weeks, in August. Always pain in that side of the head, increasing regularly; for last two weeks so severe that he could not sleep.

October 17, 1900. No discharge from the ear. No perforation of tympanum, but considerable thickening. Watch i. c., not much better in right ear. Mastoid region swollen and edematous, auricles standing out; severe pain on pressure. Advised operation at once; patient did not consent; ordered ice, etc. Patient called two days later but missed me and was not seen for the next two weeks.

October 30, 1900. Excruciating pains in the head, chiefly at night, so that he had hardly slept since; considerable remission during day time; did even work two days ago. Headache was felt in whole head, but referred mainly to the occiput. Touch and pressure everywhere in back of head exceedingly painful. Condition of ear and mastoid same as when seen at first. Temperature below 100. Stated that he had never had a chill, that he sometimes felt dizzy, but not at this time. Nothing abnormal was noticed in his gait, although a special examination as to this point was not made, as no brain abscess was suspected.

October 31, 1900. Operation under narcosis. Immediately after the incision there was noticed, at its upper and posterior end, a small fistula in the bone. The exploration of this was postponed until later in the operation. First, the mastoid was opened. Pus immediately below outer shell. Very large cavity filled with pus and detritus, especially downwards to the very tip of the mastoid, whose

mesial wall was somewhat carious. Also pus in the antrum. Sinus wall examined carefully; apparently normal.

The above mentioned fistula in the bone was 1 1-2 inches backwards and upwards from the mastoid opening, at the place where the three sutures meet. A small amount of pus was oozing out of it. Fistula was enlarged to a roundish opening, 1 cm. in diameter. All around it the dura and pia mater were adhering to the bone. They also showed a small perforation, through which the probe entered mesially into the cerebellum, 2 cm. deep. Dura incised and cerebellar abscess opened with knife. One and one-half drachms of yellow, absolutely odorless pus evacuated. On account of location of abscess, and the mentioned appearance of sinus wall from the mastoid wound, it was supposed, that in this instance the path of infection was not the usual one; viz., through the sinus, and therefore, the sinus was not opened. Abscess drained in usual manner.

Patient was free from headaches about one week. Temperature reached 100° F. only once; discharge daily about one drachm, decreasing steadily. On November 10, headaches again appeared, increasing in severity. These were first attributed to insufficient drainage. The drainage tube was, therefore, removed, the external opening of the fistula freed from the granulations which had sprung up, and iodoform gauze substituted. In spite of this, the headaches persisted and the temperature rose to 101° F. On November 29, some swelling and tenderness in neck was observed, and on pressure in this region, some pus escaped through the fistula, which proved connection. Careful probing discovered another fistulous path, mesially and downwards.

November 30. Second operation. First incision elongated downwards. Entered between the sterno-cleido and the splenius through the deep cervical fascia, till the finger could explore the region behind the mastoid tip. There was no pus found between the muscles. In the depths of the wound, the finger felt a soft membrane. On pressure on this, pus escaped through the fistula. It was evidently the bare inferior wall of the sinus, whose bony covering had been destroyed. The knee of the sinus was then laid free for 1 1-2 inches, by chiselling away the bone between the mastoid wound and the fistulous opening. Some pus around the sinus. The latter was incised in its entire length. It contained a small thrombus, which was removed and the sinus cleaned. There was a very small hemorrhage; apparently the sinus had collapsed and the walls were adhering, upwardly as well as downwardly. From the upper end of the opened sinus, the fistula leading into the cerebellum was plainly visible.

Subsequently, the recovery was an uninterrupted one. The discharge from the cerebellar abscess ceased in one week. The large wound healed by granulation, and was finally closed by a plastic skin flap, on January 22, 1901. The patient could be dismissed on February 17.

This case supports the standpoint taken lately by other authors, that, in searching for an otitic cerebellar abscess, it is always best to go through the sinus. The infection may travel through the labyrinth and from there by way of the internal auditory canal, or one of the aqueducts, but in more than 75 per cent it goes through the sinus. Although this point was taken into consideration during the first operation, as mentioned above, the conditions found viz., the apparently healthy wall of the sinus, and the unusually high location of the fistula, spoke against it. It became evident during the second operation that the fistula led into the sinus, and through it into the cerebellar abscess, but since the dura was adherent all around the fistula, it was impossible to recognize the true condition.

As found so often, the symptoms of the cerebellar abscess were absolutely masked, the headache being sufficiently explained by the mastoid abscess.

Of the three cases of brain abscess, one has just been reported; the other two were not operated upon. In one a post mortem was made; in the other, the diagnosis was only "the most probable" from the symptoms.

Case 1.—F. F., æt. 15, otorrhea in left ear since childhood. Treated from time to time, when the discharge was more abundant, at different dispensaries. Occasionally headaches, which became gradually more constant and violent for the last six months.

After a visit to the dispensary, where "they stopped the discharge at once" as the mother expressed it, there was a sudden violent headache, accompanied by nausea and dizziness. Next day, some convulsions, which induced them finally to call in their family physician. He found a temperature of over 104° F., slight delirium, restlessness, severe headache, and made a diagnosis of commencing meningitis. When seen by me the next day, the general condition was about the same as described. The external canal was filled with thick, fetid pus, the wall so swollen, that it was impossible to introduce the smallest speculum. The mastoid region considerably swollen, red, and tender on pressure. Mastoid operation advised under the supposition that a meningeal process had started from there, and might possibly not have advanced too far.

Operation next day. A large mastoid abscess and destruction of tegmen tympani found. For the next few days the patient seemed to

improve; the headache disappeared almost completely, the fever went down to 101, she became more conscious, answered questions. The discharge continued a profuse one through the mastoid wound as well as the external canal. Then a relapse took place, she sank more and more into coma, paralysis of the right side appeared and she died, in a comatose state, 13 days after the operation. Facial paralysis or palsy of one of the motor-oculi nerves was never noticed.

The autopsy was held the next morning. The skull was opened in the usual way; dura mater of the convexity somewhat congested, but not more adherent to the bone than usual. The veins all over-filled. On attempting to take the brain out of the skull, there was a gush of thick, yellow, fetid matter, which came out of an abscess cavity in the left hemisphere. This will be described later on. It had opened at a place opposite the posterior wall of the petrous bone, and had been adherent to its periosteum quite firmly around the point of opening; adhesions were found nowhere else. The whole dura mater of the base was covered with pus, but the greater portion of it came evidently from the abscess. After the brain had been taken out, the whole temporal bone was removed by two uniting sections.

The dura mater covering the tegmen tympani and the posterior surface of the petrous bone was thickened, and of a dirty greenish-black color. In the midst of this, over the aqueductus vestibuli, there was a small hole occluded by a protruding clot of thickened pus, which corresponded to the opening into the brain abscess. The temporal bone was then divided to show the tympanum, mastoid antrum and labyrinth. They were found to be united into one irregular cavity, partly filled with matter and detritus. A probe introduced into the wound appeared without difficulty in the middle ear. The malleus and a large portion of the thickened drum were *in situ*. The perforation of the latter was a relatively small one, in the anterior lower region. The whole tegmen tympani was carious, very thin, and showed a number of small perforations, through which pus was escaping.

The abscess cavity in the left hemisphere was situated in the temporal lobe extending backwards into the occipital lobe. It was about as large as a goose egg, of an irregular oblong shape. There was a firm enclosing capsule of connective tissue. The opening at the above mentioned place was large enough to introduce a penholder, partly, of course, artificially made. The pus within the cavity was of the most offensive character, so that it was nearly impossible to remove the odor from the hands.

Case 46.—A. B., æt. 23. Had been treated for "neurasthenia" for some time and once had to be sent away from home. After her return, was considerably improved, but always was a little "nervous."

Chronic otorrhea in right ear for four years. Suppuration ceased at intervals. Subacute attacks for 5 to 6 weeks. Was confined to bed for one week. Violent pain in whole side of head. Sensorium somewhat befuddled for one day.

When seen the following day, patient was conscious, but there was slow cerebration. She answered questions correctly, but hesitatingly. Complained of violent pain in right mastoid and whole side of head. Temperature normal, pulse 60. Swelling upon mastoid, and severe pain on pressure. Palpation anywhere on that side of the head very painful, but no spot of special localization. During severe attacks of pain, some spasms of the facial muscles could be noticed, but there was no paralysis or paresis of the facial or of the ocular muscles. The pupil of the right eye reacted somewhat more sluggishly than the left. Fundi normal.

Upon the basis of these symptoms, the possibility of an intracranial complication was considered, but no positive diagnosis arrived at, and it was decided to explore first the mastoid and await further developments.

Operation next morning. External layer of bone four lines thick; outer cells as well as antrum filled with pus. Tegmen antri and tympani carefully examined but no disintegration found. After the operation the pulse sank to 54, which symptom argued strongly for a brain abscess. The parents were informed that possibly another operation would be necessary; but declared, that they would never consent to that.

During the next week considerable improvement took place. Patient was perfectly rational and the cerebral response was a fairly rapid one. Only once she complained of double vision, but when tested, no double pictures could be elicited. Temperature ranged between 98° and 99° F. The pulse rose to 74 on the day after the operation and varied then between 74 and 84. After the first week, the patient was left in the care of the family physician, and I did not hear of her until after her death.

Of the further course, Dr. K. reported:—"Patient continued to improve slowly, wound healing normally. Now and then slight headaches. She sat up four to five hours daily. Was rational. Temperature 99 1-2° to 100° F., pulse 72 to 78. On the fifth day, she complained of severe supra-orbital neuralgia on the left side. On the sixth day, she felt weak and complained of acute headache. When I dressed wound at 2 p. m., she was perfectly conscious. In

the afternoon, a friend called and the patient was talking to her while sitting in a chair. Suddenly she experienced a terrible headache, sank back, was seized by convulsions of the entire body, the respiration became stertorous, and death followed in fifteen minutes."

Of the four cases diagnosed as meningitis, one was confirmed by the post-mortem. In the others, this diagnosis was given as "the most probable one" from the symptoms.

Case 9.—E. H., æt. 22. Severe acute otitis media in right ear after influenza. Spontaneous rupture of drum followed after a few days by cessation of pain. Same process in left ear one week afterwards. On account of considerable discharge in both ears, she consulted a physician. He prescribed insufflation of boric acid powder by the patient, twice daily. Soon afterwards, headaches and pain in the right mastoid region commenced, which increased steadily.

Four weeks after the onset they sent for another physician, who found the external auditory canal completely filled with boric acid and telephoned for a consultation at once on account of the urgent general symptoms. We found the patient very weak, temperature 102° F., pulse 130, small. Both pupils dilated nearly *ad maximum*, with very slight reaction. Choked disc in both eyes, more pronounced in right than left. Ptosis of left upper lid. There was, in addition, most probably a paresis of one of the external eye muscles, but the comatose condition of the patient made an exact diagnosis impossible. Hardly any swelling in mastoid regions. After the removal of the boric acid from the external canal, there was a large perforation found in each tympanic membrane and a small amount of pus in the tympanic cavities. No swelling of the walls of the external canals. We arrived at the diagnosis of purulent meningitis, the path of infection being most probably directly through the tegmen tympani, and I declined operative interference, as I considered the case too far gone.

During the next two days the symptoms increased in severity, but on the morning of the third day there was a marked improvement. The sensorium had become quite free, and there was a large swelling under the fascia of the sterno-cleido of the right side, due to a sinking abscess. The patient herself remarked that "it had gone down there now." Dr. S. called me in again, and we decided, that the case might not be beyond operative reach. Operation same day. After the first strokes with the gouge, the external auditory canal filled with thick, yellow pus. In the bone, a large abscess cavity was found. The superior and mesial wall was carious, and an opening through it lead into another abscess cavity. Whether this latter was sub-

dural or intradural, I am unable to state, for at the same moment respiration ceased and a few minutes afterwards she died on the operation table. Post mortem not permitted. Whether this patient could have been saved by operating after the first visit, remains an open question. The palsies spoke certainly more in favor of a diffuse meningitic process.

Case 60.—J. S., col., æt. 48. Otitis media and otorrhea in left ear for two months. Typical mastoid symptoms for two weeks. Operation emptied a large abscess and detritus cavity, reaching into antrum. The course was an absolutely normal one for three and one-half weeks, and not the least symptom suspicious of an intracranial affection was manifested. The patient came to the clinic for the dressing from the sixth day after the operation. On the 26th day, he had a chill and headache and vomiting. Confined to bed two days. There was suspicion of sinus thrombosis, but the attack seemed to have been one of gastritis, after eating too many tomatoes, and passed over entirely. The suppuration from the ear had ceased in the third week, and the mastoid wound had closed and the patient was dismissed six weeks after the operation.

The next day, he came back in a half comatose condition and stated that he could not pass urine for the last 24 hours. Sent to City Hospital. The catheter found only a small quantity of urine in the bladder. Patient became more comatose, pulse 72, temperature 104.5° *in ano*. The differential diagnosis between uremia and intracranial complication was left open. I intended to make an explorative craniotomy next day, but the patient had regained consciousness, temperature had fallen to 99° F., and there was only some occipital headache. During the next few days, he could not be seen regularly on account of extraneous reasons. He passed again more and more into coma, temperature ranging from 101° to 103° F. He was very low on the fifth hospital day. Second operation, wound reopened, mastoid filled out with healthy cicatricial tissue. Wall of sinus firm and hard, therefore no further investigation in this direction, but trephining in cerebellar region, because the headache was most pronounced in the occiput. Some dirty lymph and small amount of pus found inside of dura. No cerebellar abscess. Patient died two days later without regaining consciousness.

Autopsy. Diffuse cerebrospinal meningitis, with tubercular nodules. Infiltration of pia thickest in right side, over frontal lobes, and below cerebellum and medulla oblongata. Dura covering temporal bone everywhere intact. Sinus opened; contained fresh blood clot. The temporal bone was removed: Entire tip of petrous pyramid was wanting, no cochlea or semi-circular canals present. The

destruction was evidently due to a tubercular process, the remnants being covered with cheesy masses and tubercular nodules.

In all probability, the caries of the petrous pyramid was the primary focus, which affected the mastoid and middle ear secondarily. It is noteworthy, that the latter two healed, while the chief lesion, which was of course beyond operative interference, gave rise to the diffuse tubercular meningitis.

Case 65.—J. D., æt. 4. When seen in first consultation, the child was in a half comatose condition. Slight mucous discharge from right ear. No swelling or redness on mastoid. I advised, for one or two days, expectant treatment, but was not called again until about one week afterwards. There was now a slight swelling in mastoid region, the child more comatose. The temperature was 103° to 104° F. *in ano*, but not of pyemic type. Next day operation. Cheesy pus in antrum. Sinus wall discolored. Sinus opened. Infective thrombus removed. Jugular vein ligated.

Picture did not change much after the operation. Temperature 104° to 105° F. Convulsions and increasing coma till fatal end four days after operation. The child was of a scrofulous type, and there is tuberculosis in the family.

Case 98.—H. S., æt. 9. Chronic otorrhea with fetid discharge for years; never any treatment. Suddenly became sick about four days ago, with high temperature and severe headaches. Attending physician, after excluding acute infectious diseases, diagnosed an ear complication and sent for me. Temperature was then 105° F. Patient half comatose, lying on left side, uttering cries at intervals. Could be aroused by talking to her, and answered slowly but correctly. Facial paresis on left side. Orbicularis only moderately paralyzed, while all muscles controlled by lower branch of facial, were completely paralyzed. No other paralysis or paresis. No swelling nor redness on mastoid or emissary regions; pain on pressure very doubtful.

Diagnosis was made of intracranial complication; furthermore, that the process went directly through the tegmen tympani without mastoid involvement; that the process was in all probabilities a diffuse meningitis, but that an abscess in the temporo-sphenoidal lobe could not be excluded with certainty. Therefore, as a last chance to save life, it was proposed to make an exploratory operation.

Operation next day. Mastoid opened in the usual manner, found healthy. Then trephined one cm. above external auditory meatus. Dura not bulging, brain substance edematous. Explored temporo-sphenoidal lobe in different directions without finding pus. Child remained in an unconscious condition until death next day. Necropsy not allowed.

I do not deem it necessary to add many remarks concerning these cases, after all that has been written of late on the subject of intracranial complications. Some of them show, that it is still exceedingly difficult, if not impossible, to make a differential diagnosis between them.

PROGRESS IN OTOTOLOGY IN FIFTY YEARS.*

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Some of you, for a moment, may be tempted to draw a long breath over the title of this paper, but there need be no cause for alarm over its possible length. Fifty years have accomplished wonders in medical and surgical science, and the ear is but a small part of the human machine and the catalogue of its progress may be run in the time of my allotment. Of course, were I to attempt a complete record of the history of otology for the past fifty years, detailing and describing the progress, step by step, the course by, or through, which, each conclusion was arrived at, and dwelling upon the minutiae of pathology, histology, bacteriology, and medicinal and operative therapy, I should very likely exceed the limit of time. However, the title of my paper admits of a much more liberal and cursory treatment of my subject, and I shall do no more than attempt a synoptical historical sketch; a mere outline reflecting the progress of otology for the past half century.

I confess that when I handed in the subject of this paper to your secretary I had expected that it would require more time for its enumeration than I shall allow it, the error growing out of my restriction to more recent discovery, some of the approved methods of modern otologists. The practitioner of to-day is one who seeks new, instead of old knowledge and wishes to be "up-to-date," hence, he buys new editions and rids himself of the old. He wants results, and in a progressive science like medicine the physician is required to be on the alert that he may be equipped to offer the most potent remedies for human suffering, and that he may not be placed in contrast with his neighboring competitor to his discomfiture and humiliation. So while I might insult some of you if I offered a paper attempting to instruct you on "up-to-date" otology, I can, without fear of offense, draw a dividing line between the knowledge of the otologist of 1853 and that of us of 1903, enabling some of you, no doubt, to appreciate the fact that much of our vast present day attainment was the possession of the otologist of fifty years ago. It happens that I have for reference the standard work of that day as a line of demarkation separating what they knew from what we know. It serves my purpose, and in what

* Read by title at the Eighth Annual Meeting of the Academy of Ophthalmology and Oto-Laryngology, held at Indianapolis, April 9, 10 and 11, 1903.

I shall say, William R. Wilde's "Practical Observations on Aural Surgery and the Nature and Treatment of Diseases of the Ear," 1853, is my chief authority.

While I do not minimize the importance of the scientific knowledge which we possess of the ear and its diseases, I make bold to say that the most important discovery which we have made since 1853 has been in the elaboration of the work of the surgeons and not through the individual discoveries of otologists or through disassociated achievements. Our progress is largely embraced in the treatment of suppurative conditions in which the elements of pathology, histology, bacteriology, instrumentation and operative technique have part; all of which are more or less connected with surgical procedure than general medical therapy.

In pathology we have the basis of the whole scientific fabric, and in his application of it to causes and effects, the otologist has been no laggard, but has caught the spirit of all medical science. Without a correct knowledge of pathology we are in the dark and incapable of intelligently addressing our therapeutic resources.

Now, while the aurist of the early half of the past century knew the anatomy of the ear as minutely as we do, he did not appreciate the intimate relationship and bearing of one organ upon another, nor the etiological influence of the one as a factor in the production of disease in its neighbor. For instance, he was not cognizant of the effect of nasal upon aural parts, as influential in the production and continuance of disease in the post-nasal space, and its extension through the eustachian tube into the middle ear. We made a long step when we arrived at an appreciation of the necessity for free nasal passages and a healthy mucus membrane as indispensable to the cure of certain conditions within the tympanum. To one man do we owe the one great discovery of otology for the advancement of our science, the only discovery of unquestionable and consistent value made by otologists during the fifty years past. Need I mention Wilhelm Meyer? I confine myself to 'contributions of those of our cult, and restrict their offerings to those that were not built upon the foundations of their predecessors, nor are modifications, however meritorious, of methods already promulgated. To Lister, surgeon, do we owe the major part of our progress in scientific otology from the time I have elected to consider, for within this great epoch has been developed the perfection of all surgical procedure to which otology owes most, of the commanding basis it now occupies. Wilde and his contemporaries knew the importance of antiphlogistics in acute congestion in the parts adjacent to the middle ear, and they fully appreciated the

value of drainage and cleanliness as demonstrated in "Wilde's Incisions," but without antiseptics they had not learned with what impunity the human body may be penetrated and how thoroughly the mastoid may be drained. Our appreciation of the tremendous importance of pus elimination has come to us through the teachings of Lister, the influence of antiseptics, otology having developed in the same way that it has affected all surgical consideration.

In instrumentation, diagnostic and operative, we have first in importance the laryngoscopic head mirror, through which our explorations of the ear is more complete. Our tests and discernments of ear diseases are far more comprehensive and accurate, based as they are upon increased knowledge of histology, bacteriology and pathology. The use of the tuning fork, Galton's whistle, Seigle's speculum, otoscope, etc., have all perfected us in diagnosis, while the impunity of surgery has naturally added boldness to dexterity. In this connection it is meet that I should refer to the Politzer bag, the most valuable adjunct to the aurist's armamentarium in diagnosis and treatment of congestive conditions in the eustachian tubes and middle ear. Notwithstanding its inferior importance, to Meyer's elucidation of adenoids and the still greater revelation of antiseptics in estimating the value of Politzerization, so called, it were well to remember that the catheter and Valsalva's method antedated it many years, and the Politzer discovery does not involve a demonstration of the improvement through inflation of the middle ear in Eustachian tube catarrh. The fact was well known by the aurists of the time of Wilde and before, and Politzer simply demonstrated a new method built upon the old, by which air may be forced through the Eustachian tubes into the middle ear cavity. It was, indeed, an improvement, and a more scientific method than Valsalva's, but when we consider that all this was well known, and the ease with which the ear may be inflated by means of these several methods, the mystery is not that Politzer discovered inflation by a rubber bag, but how it happened that it was not discovered by some of his predecessors. In the diagnosis and treatment of tubal catarrh and in certain nasal obstructions, Politzer's bag is indispensable, but in the large majority of cases the catheter is far more effective and scientific. Catheterization addresses a direct and concentrated stream of air, vapor or fluid through the tube into the tympanum, while the bag projects a distributed and rarified current of air or vapor only. The modifications of Politzer's method are much more satisfactory than the simple bag for office uses, though the latter is a valuable adjunct at the bedside.

In summing up the advances made in otology during the past fifty years I conclude that they almost entirely hinge upon antiseptics,

pathology, bacteriology, histology and operative technique. Out of these have grown perfection in diagnosis, and a clearer realization of the necessity for drainage and cleanliness in suppurative conditions and an improved operative technique together with a skill and boldness in draining cavities containing pus. Pathology and its collateral branches add to our knowledge of the cause and course of diseases and are used as methods for the arrest and eradication of offending matter. Out of the appreciation of etiology has come a more perfect perception, and, leading on, these have developed accuracy of diagnosis and skill in operation until at last we have, full fledged, a specialty recognized as one of dignity, through skill and achievements.

I would that I might dwell longer upon the list of inventions and discoveries by otologists, but however we may have arrived at our improvements and advances they are admitted and are permanent. Our least accomplishment seems to have been in the treatment of chronic deafness without suppuration, and I particularly refer to that intractable malady known as sclerotic deafness. The various operations and instruments designed to improve sclerotic deafness are all of doubtful utility and those who are treated for this disease are improved just about as much as they were fifty years ago, when some aurists poured glycerine into their ears. We have learned to distinguish between catarrhal deafness and a true sclerotic process, but in naming the disease have not named a remedy. Thus it is that this common class of sufferers go on and on until finally wearied of the ineffectualness of treatments they become a menace to our material success and a reproach to otologic science. And what has been said of sclerosis can be applied to internal ear diseases. Here again we have added a little to our diagnosis and named a disease or two without naming a remedy.

On the whole, we have done well, considering that it has been many years less than fifty since this branch of medical science attained the dignity of a distinctive science and evoked a concentrated effort of a large body of workers. Now that all of medicine is upon such a scientific basis and so many are concentrating their efforts upon otologic science entirely, which is recognized as a department of medicine of vast importance, we may expect that in 1953, should some one elect to write an account or resume of the progress of otology in the interum between now and then—as I have tried to do of the preceding half of the century—he may point to a large list of achievements by otologists, standing distinctly upon their own foundations, and not elaborations of the work of others.

NASO-PHARYNGEAL FIBROMA—EXHIBITION OF SPECIMENS AND NEW FORCEPS.*

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Fibromata of the naso-pharyngeal space are entirely different histologically from edematous or polypoid growths, and vastly more serious, being extremely hard and vascular, with large base—not pedunculated, but broad and irregular—springing from the periosteum or fibrous layer. They grow rather rapidly, and, having filled the space in the naso-pharyngeal vault from which they have their origin, they invade other cavities, after causing absorption or resorption of the bony structure intervening, sending out arms in various directions along the lines of least resistance. Prof. Moritz Schmidt has found only one case in every 2438 of naso-pharyngeal growths. They are even less frequently found in this country. Of thirteen cases, seven were in males. The surface of the growth frequently ulcerates, which leads to adhesions, which complicate operation for removal. The blood supply is large, being made up of small arteries. As a result of this free arterial blood supply, the hemorrhage is violent and alarming, quickly rendering conditions for a time critical, unless very promptly controlled.

The ages of patients I have seen have been fourteen and sixteen years. Zarincho, quoted by Bensch, gives as one of the theories why these growths are found in the young, and not after the twenty-fifth year: "During the period of development, for unknown reasons, the periosteum may become unable to form bone over a circumscribed area, and the physiological increase of nutrition incident to the development of the body at this period, causes an equal amount of nourishment to be carried to this circumscribed area, which not being used up in the formation of bone, leads to hypertrophy of the periosteum at this point, and consequent development of the fibroma." This seems to be a rational explanation of the cause—and the arrest of the development of the skull after the twentieth or twenty-fifth year, when this increased nutrition ceases, explains the cessation of development of growth at this time. Bosworth reports cases of spontaneous disappearance.

The fibromata included in the report are those that spring from

* Read at the Eighth Annual Meeting of the Academy of Ophthalmology and Oto-Laryngology, held at Indianapolis, Ind., April 9, 10 and 11, 1903.

the vault of the pharynx and are most dangerous because of their great vascularity—the origin of this being a central artery coming from deeper structures. Karl Hirschberg regards these as "Reste," or remains of the cord, and has reported two cases, one growing out from the fossa sphenopalatine, developing outwards and involving nearly one-half of the skull. The other sprang from the

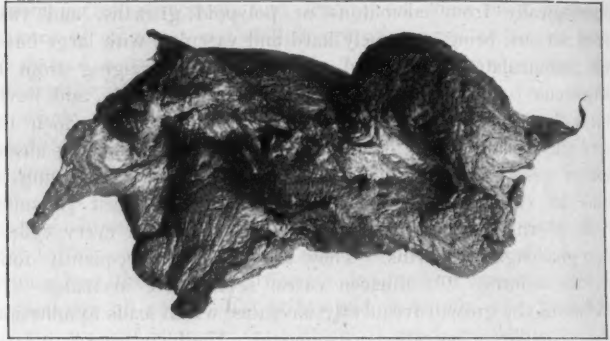


Fig. a. Showing posterior surface of attachment.

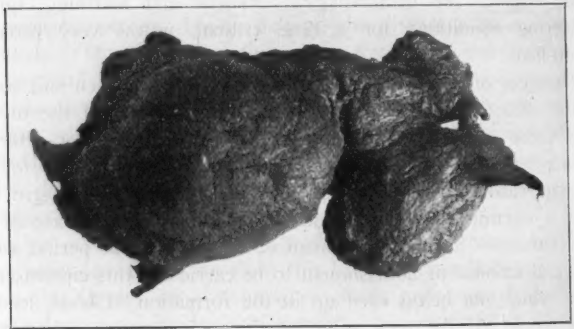


Fig. b. Showing anterior surface.

Plate I. Case I.

sphenoid bone. He describes them microscopically as being remnants of the cord, in one case having more of the appearance of sarcoma, while in the other that of fibro-sarcoma, or fibroma. He regards them as non-malignant, as they do not infiltrate other tissues. Bensch says they are "clinically and not anatomically malignant." This I believe to be true.

Cases I have had with similar history: Mouth breather, gradually becoming worse until growth becomes so large as to interfere dangerously with respiration, but seriously impairs deglutition. Emaciation from want of nutrition, and weakness from frequent hemorrhage, made the cases, when I first saw them, most pitiable objects to look upon. In the two cases the growth protruded into the mouth, was smooth, pinkish color, lobulated, etc., was attached to the entire vault of the pharynx, one arm extending into the right nares until it protruded through the nostril, antrum wall was absorbed and antrum filled with growth. Electrolysis had been repeatedly and thoroughly used for months before radical operation was performed.

Before resorting to this, it is well to bear in mind the remark of Driffenbach in his recent text: "Great courage is required to undertake this operation, because the surgeon is almost compelled to choose between one of three conditions: Choking to death of the patient during the operation, bleeding to death at the time of the operation, or not finishing the operation." These conditions result from difficulty in reaching the seat of growth. The cold snare and cautery loop were faithfully tried, but on account of size, shape and location of attachment, were only partially successful, and in my first case, the aid of the general surgeon was called, who did the external operation. I now believe that the entire operation should be done by the rhinologist, because of the greater dexterity which he acquires by daily practice within naso-pharynx and nares. Furthermore, I believe any growth having its attachment within the nares or naso-pharynx can be radically removed through natural openings, without any external incision, by use of snare and forceps.

The first specimen I show you is from Case 1, operated upon May, 1894—R. H. aet. 15—mouth breather—increased difficulty began one year ago—rapidly grew worse—at this time nasal respiration impossible—pain in right ear—speech greatly impaired, also sense of taste and smell—deglutition markedly interfered with—right nasal cavity completely blocked up, and growth protruding through the anterior nares. Upon opening the mouth a large pinkish gray tumor completely filling the pharyngeal vault, pushing the velum palati forward until stretched to its utmost, and extending downward until half of pharynx was filled. Electrolysis had been faithfully used without appreciable result. Attempts were made to remove growth by ecraseurs and snares (made for the purpose) both through the nose and mouth, but these were also ineffectual. It was impossible to put a loop around the base, and the external operation of slitting open the cheek was successfully

performed, though the recovery of the patient was little short of miraculous. The growth shows the imprint of wire used in snare of extra strength and size, made specially for the case. The wire was gradually tightened every two hours. This was kept

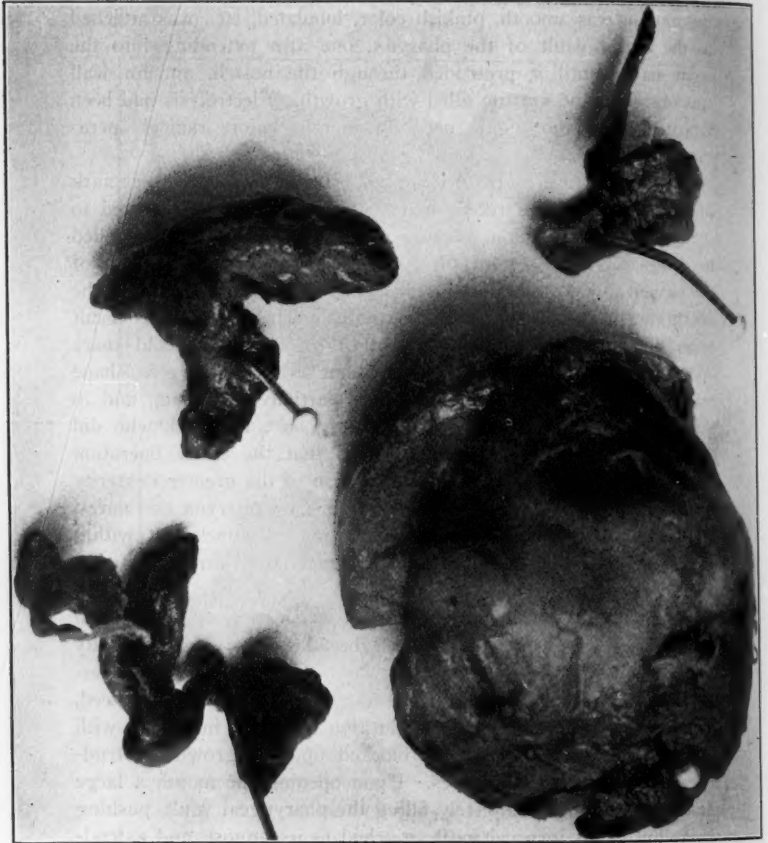
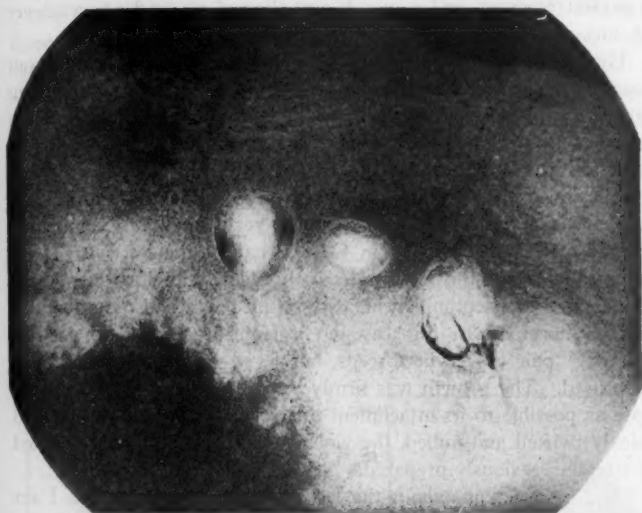


Plate II. Case II. (Exact size.)

The largest and smallest masses removed with forceps.

up for three days and nights, when the No. 3 piano wire broke without cutting through. I afterwards succeeded in removing about one-third of it through the nose by twisting and pulling with large hemostatic forceps. The external operation was after-



Plates III and IV.

Microscopic sections of growths removed from cases I and II.

wards performed by Drs. Barrow and Kinniard. The patient made a perfect recovery and a month ago showed no evidence whatever of any recurrence.

The second specimen is from Case No. 2, W. C. aet. 15. About nine months ago first noticed very great difficulty in breathing through the nose—his parents often feared he would choke to death in his sleep. Previous history of nasal discharge; Frequent attacks of sore throat and recent attack of measles and whooping cough; since then the tumor, which now filled the entire vault of pharynx and left nostril, had grown very rapidly. Examination showed same conditions as in Case 1, except the left nostril was involved and not the right. In both cases, adhesions were very abundant, to the septum, turbinates, velum palati and posterior wall of the pharynx. In this case no attempt was made to use the snare. A pair of cervix forceps, borrowed from the gynecologist, were used. The growth was firmly grasped through the mouth, as close as possible to its attachment to the vault of the pharynx, and quickly twisted and pulled, the violent hemorrhage being controlled by tampon previously prepared.

There is one point about the last case operated upon that I am watching with interest. Some German operators claim that if we destroy the larger part of the growth that the remainder is absorbed. I did not get all of the growth in the last case (a piece as large as a grape remained), as I had to stop on account of the condition of the patient. Transfusion of normal saline solution was used with gratifying results.

In regard to the operation, if the growth has a pedicle around which a loop of heavy wire can be passed, this should be done, and after using all force possible (without breaking the instrument) in tightening the loop and strangulating the growth, by twisting and pushing and pulling, the growth is separated from its attachment and removed. This can be done where the fibroma is pedunculated and the snare can be used, while the hemorrhage is very free for a few seconds, the tampon is not always necessary.

In cases like the last ones referred to, where size, shape and location or attachment did not permit of use of wire loop, the following method was used:

- (1.) Parts cleansed as well as possible with syringe anteriorly and post-nasal.
- (2.) Anaesthetic administered.
- (3.) Tape pushed through nostril and brought out of mouth, to which was attached firm gauze tampon; this given to assistant to hold.

- (4.) Mouth gag securely inserted and held in place.
- (5.) Insertion of each blade of forceps, as you would obstetric forceps, being guided by the finger so as to engage largest and most important portion of the attachment as high up as possible.
- (6.) Blades are locked and patient turned well onto side, and head brought to edge of table. Everything being in readiness to meet any possible danger—transfusion apparatus with normal salt solution, etc.
- (7.) Growth being firmly grasped, by a quick and rapid motion is twisted and pulled out. The terrific hemorrhage which follows the detachment of the base is quickly stopped by pulling the tampon well into the post-nares and the pharyngeal vault by means of tape previously introduced. This may be removed in twenty-four to thirty-six hours, according to indications.



Plate V. Case 3.

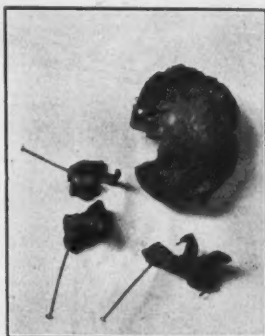


Plate VI. Case 4.

(Exact size.)

The two cases I have operated upon have almost proven true the predictions of Driffenbach, and have led me to devise and have made the forceps which I show you. The pattern is that of the adenoid forceps, the blades being much stronger, with a tooth edge specially constructed to prevent slipping. A lock similar to the obstetric forceps is used so as to facilitate easy and quick manipulation, the ratchet so as to firmly fix the handles and prevent the shifting of the blades.

Given another case like either of the ones reported, I would first ligate the external carotid artery of the side to which most of the growth was attached. The reports of Nicholson of Atlanta and Keene of Philadelphia have, in a number of cases, found no evil results from its ligation. On the contrary, both these surgeons

emphasize the simplicity and effectiveness of the operation. Not only in such cases would I tie this artery, but in any case where a severe hemorrhage followed or was likely to follow any operation within the nose or pharynx. The free anastomosis renders control of the main trunk devoid of danger to the life of the tissues, and assures the subsequent return of circulation to the extent of carrying on proper nutrition. This preliminary operation will make the use of the tampon unnecessary and prevent the so-called surgical shock. It is easily and quickly done, and I believe every throat and nose surgeon should be prepared to do it. With the hemorrhage controlled, the operation upon the two cases above reported would have been easily performed with the forceps I show you and not have been the bloodiest, most harrowing and uncertain of all surgical operations.



Plate VII.

Forceps for removing Fibroma.

In addition to my own cases, I want to show specimens from two similar cases operated upon by Dr. T. W. Moore, of Huntington, W. Va., with a brief history of each.

Case I. Perry McCoy, age 18. Tumor was first noticed four years ago. Patient claims to have suffered with intense headache all the time since he first noticed growth. At one time a prong protruded from left nostril, which was removed several months before I first saw him. Posterior portion of left nostril was entirely filled with tumor, which seemed to be wedged therein. Could pass finger about it in pharynx. After packing adrenalin solution about it (1-2000) I could move it, and ascertained that its only attachment was to posterior end of left inferior turbinate. After one hour's work I succeeded in passing a cautery wire over it. It was removed with difficulty after it was detached, and this started profuse hemorrhage that was controlled by packing posteriorly. The small growth was attached about the junction of the

middle and posterior thirds of the same turbinate. It was removed with the cautery snare after having broken No. 5 piano wire in steel snare. There was considerable pus flowing from the sphenoidal sinus, but patient would not wait to have it treated, and left for his mountain home (fifty miles of which he must walk) six days after the removal of the larger tumor, declaring that he felt better than he had for four years. Tumor weighed 240 grains. Operation performed December 3, 1902. Have no report from patient since he left on December 9, 1902.

Case II. Lewis, residence near Guyandotte, W. Va., age 12 years. Operation December 17, 1902. His family physician discovered growth one year ago. During this time he has been trying to absorb it by electrolysis. One prong protruded from left nostril, one edge could be seen below velum palati. Under chloroform I slipped a cold wire over tumor through mouth and removed by traction, it requiring considerable force. There was profuse hemorrhage for about five minutes, stopping spontaneously. Tumor was very firm, had but one attachment—the vault of the pharynx—and was decaying in two places, probably from pressure. After washing it weighed 14 drachms avoirdupois. The boy, who was weak and anemic, gained thirty pounds in six months, developing from an undersized, puny child into an extraordinarily large boy of his age.

Following is report of examination made by Dr. D. Brayden Kyle of Philadelphia:

1517 Walnut street, PHILADELPHIA, March 28, 1903.

DEAR DR. STUCKY—

Enclosed please find report on specimens which you sent me. It is most unusual to find four cases so nearly alike. I would be glad to have a reprint of your article. Your friend,

(Dictated.)

D. BRAYDEN KYLE.

To Dr. J. A. Stucky, Lexington, Ky.

REPORT OF SPECIMENS FROM DR. J. A. STUCKY.

Specimen No. I.—Sections from this specimen showed certain areas of fibrous tissue resembling very much in character the fibrous tissue due to inflammatory action, while other areas were of the soft variety, showing spindle cells and fibrillae, and was exceedingly vascular. The blood vessels had very thin walls, but were especially numerous. Owing to the difference in the structure of the tumor it reacted rather curiously to the stain. I think, however, that instead of this peculiar reaction being due to any special cellular

change, it entirely depended on the fact that the more dense fibrous tissue took up the stain much more slowly than the softer areas. While the distinct fibrous areas were very small and not at all numerous, it gave to the section a rather odd appearance. At no point was there any evidence of malignancy. There were, however, a few areas in which the tissue was infiltrated with small round cells, but from the appearance of the surrounding tissue and of the blood vessels I am quite certain this was only a small area of inflammatory infiltration, and was not sarcomatous. I would scarcely call the tumor an angio-fibroma, but simply a highly vascular fibroma, as there is a distinct difference between a highly vascular tumor and angioma.

Specimen No. II.—Examination of this specimen showed almost the same appearance as No. 1. This is especially true of the connective tissue. However, the tumor was much more vascular, the vessels being very small and numerous. The walls of the blood vessels were fairly well formed and the surrounding tissue showed no signs of malignancy. I would give the same diagnosis from the microscopic appearance as in the preceding specimen, that of vascular fibroma. It is most unusual to find two tumors resembling each other so closely in microscopic appearance.

Specimen No. III.—This specimen has more the appearance of the myxo-fibroma. Certain areas, however, showed broken down tissue, which from its appearance, and the appearance of the tissue surrounding the area, I believe to have been an area of hemorrhage followed by necrosis. Some areas in which necrosis had not taken place supports this theory. There was, however, near the surface of this tumor, certain areas of small, round cell infiltration resembling very much, areas seen in the beginning of small, round cell sarcoma. However, I am inclined to think that it was nothing more than an inflammatory area, as in no instance did I find any blood vessels similar to those found in the sarcoma. While the tumor was fairly vascular, it was not markedly so as in No. 1 and No. 2.

Specimen No. IV.—This was almost identical with No. 3, with the exception that the epithelial layer was slightly thickened and some epithelial cells were found beneath the basement membrane, giving a suspicion at least of epitheliomatous infiltration. While the tumor was highly vascular, there was no marked alteration in the blood vessel walls.

THE TONSIL SNARE.*

BY W. H. PETERS, M.D., M.S., A.C., LAFAYETTE, IND.

Some years ago I presented to the profession a tonsil snare which had been in use for some years in my office. The snare had been thoroughly tested by several intelligent operators for a period of from eight to ten years, and the results had been so satisfactory that I considered them worth reporting. These snares have come into general use. Many thousands of them have been sold, but of late I have had so many inquiries in regard to the matter, and so many complaints, that I have thought best to give THE LARYNGOSCOPE readers the benefit of the answers which I have been compelled to write so often to individuals.

In the first place, there has been much dissatisfaction with the snares which have been made and furnished in the market, many of them having been made of cast iron, some of brass, and some of steel, so soft and inelastic that they either broke or quickly lost their shape. Most of those upon the market are altogether too large and clumsy, and not one of them in fifty, possesses the qualities which have made my original instrument so satisfactory in my own hands. The instrument is not a very large one. It should be made of the best of steel, very stiff and inelastic, and in every part should be free from any possibility of bending or yielding in use. To be satisfactory the snare must be absolutely rigid. Personally I have removed many thousand tonsils with this snare, and it has never failed me nor disappointed me.

The instrument may be described as follows: It consists of a handle, a canula with fenestrated tip, several of which are furnished with each instrument, and a screw adjustment, similar to that found on nearly all other snares. The screw adjustment in this instrument, however, has never been used by me, except for the purpose of taking up the slack wire before the operation. I use No. 7 piano steel wire, and here I will say that first-class wire is very difficult to obtain in the market. The best grade of wire is highly polished and very elastic, and possess very great tensile strength. There is no danger of it breaking. Before threading the snare, a loop should be formed upon the wire in the manner first suggested by Dr. A. T. Veeder of Pittsburg, Pa. One of the canulas should be inverted, and the two ends of the wire passed through it as

* Read at the eighth annual meeting of the Academy of Ophthalmology and Oto-Laryngology, held at Indianapolis, Ind., April 9, 10 and 11, 1903.

shown. A cork should be passed through the loop of the wire thus formed, the wires are then drawn in tightly, and shoulders are formed whereby the wire fits the fenestrum more perfectly. The complaints which have been made in the past, of inability to fasten the wire satisfactorily, have been entirely overcome in the present model. The ends of the wire must be very firmly twisted, not less than seven or eight twists being given them.

In an adult the operation is conducted as follows: Cocaine having been applied around the tonsil and in its crypts, five minutes are given for it to take effect. In the meantime the canula with the wire threaded has been sterilized, and the snare prepared for the operation as shown in the illustration, all of the slack wire

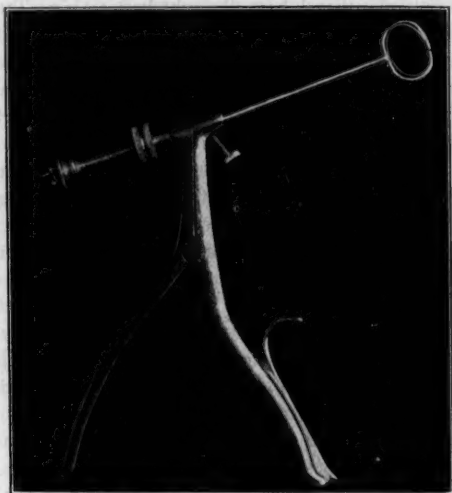


Fig. I.

having been taken up by the screw adjustment. In an ordinary tonsil no forceps of any kind are necessary. The patient is seated in an ordinary operating chair, and the tongue is held down either by the operator or by the patient himself. The fenestrum with its guarded wire is pressed firmly down around the tonsil, when, with some manipulation, the tonsil will soon be seen to start forward through the loop. This movement of the tonsil, I have compared with the movement of the eyeball in the removal of an eye, when after the severing of the recti muscles, the speculum is pressed down into the socket, and the eye starts forward. At this point, the operator is instructed to sever the nerve with his scissors. Just so in the removal of a tonsil, when the tonsil starts forward into the loop,

the operator closes his hand upon the instrument, severing the tonsil with a single stroke.

The after treatment is very simple. The patient is instructed that crackers and milk, medium boiled eggs, and raw oysters can be swallowed with very little pain, and the patient is permitted, if he wishes to do so, to suck pieces of ice, holding them well back into the throat. The pain and soreness, however, are not very great, and I have never had a patient hesitate when it came to the removal of a second tonsil at a later sitting. As a rule, I remove only one tonsil at a time in an adult, and in the great majority of cases the tonsil is completely extirpated with a single application of the

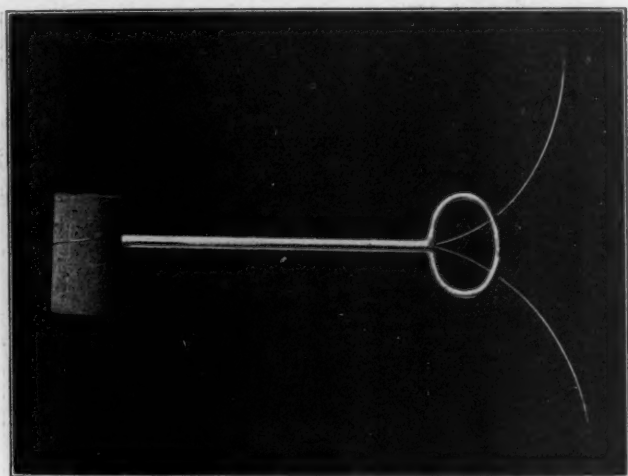


Fig. II. Showing the method of forming the wire loop.

snare. In some cases seizing forceps are necessary, and when so I recommend the forceps in the cut which were designed by myself for this purpose many years ago.

In little children I almost invariably use chloroform. In these cases it is much better to have two snares sterilized and ready, and both tonsils are removed at the same time. I do not believe that the time which has been required in my office for the removal of both tonsils in little children under chloroform has averaged ten seconds. Immediately following the removal of the tonsils, with only such interval as is necessary to drop the snare and seize a suitable Pyncheon's curette, I remove the pharyngeal tonsil when it

is present. Every step of the three operations from beginning to end is a matter of but one or two minutes, and it is extremely rare for the child to be in my operating room more than fifteen or twenty minutes. The child is then ordinarily removed to a room adjoining, where, if so inclined, it is allowed to sleep off the effect of the chloroform, although in the great majority of cases the child is completely aroused within ten or fifteen minutes.

I have used these instruments constantly for over sixteen years. In my experience in children I have invariably found that under an anæsthetic the removal of both tonsils has left me a bloodless field, or practically so, for the removal of the pharyngeal tonsil,

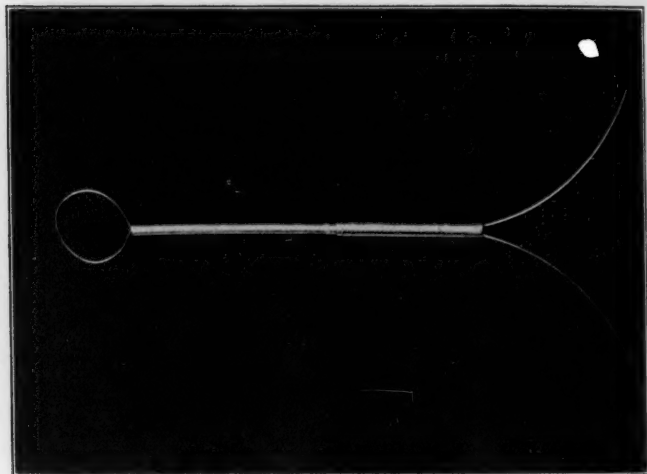


Fig. III. The straight canula.

while the removal of a single tonsil with the guillotine generally leaves the mouth so full of blood as to render the removal of the second tonsil somewhat unsatisfactory. In adults my experience has been similarly satisfactory. On one occasion a patient was brought to my office suffering from a secondary hemorrhage following a partially removed tonsil. The hemorrhage had intermittently lasted for two days, and the patient was in a serious condition. The removal of the remnant of the tonsil, made by the method described above, stopped the hemorrhage immediately. It has been said that the words "always" and "never" have no place in medical literature, and it is probable that there is no means by which a tonsil may be

removed that there is not some danger of hemorrhage. Dr. Balenger of Chicago has reported a serious hemorrhage in an adult from the use of this method and instrument. Such hemorrhages have, however, occurred from the slow ecrasement of the tonsil, and from the use of the galvano-cautery loop, and were numerous under the old guillotine and bistoury methods. Such danger following the use of the snare, however, is very remote, and may be practically disregarded.

Here I will make a suggestion. I do not know whether the procedure is new or not. I have used it repeatedly with the greatest satisfaction, when from any cause a hypertrophied tonsil has become inflamed, and its increased size renders it more troublesome. In syphilitic ulceration and in ordinary acute follicular inflammation of hypertrophied tonsils, I invariably remove the tonsil immediately, and have had as yet no reason to regret it. Also in cases of

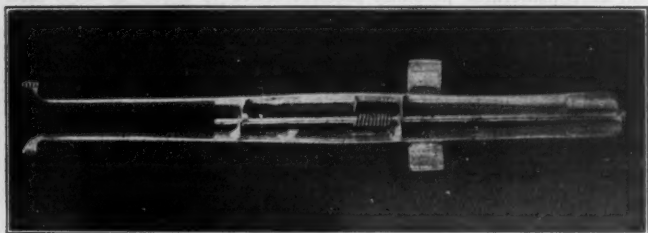


Fig. IV.

diphtheria, or where a child has been exposed to diphtheria, I have made it a practice to clear away the obstruction of the throat with very little ceremony.

In connection with this instrument, I wish to concede to Dr. Veeder the credit of using a fenestrated grooved tip for the tonsil snare. While my own work preceded his by some two years, still my snare was never satisfactory until his fenestrated canula came out. I have altered this canula at the present time, but he is still entitled to the credit for its originality.

In small and prominent tonsils, especially in adults, a straight metal tip in place of the fenestrated one has decided advantages. A wire should never be used a second time, and it is a positive advantage to keep the wires in a straight metal tube, rather than in coils.

I will be pleased to answer any questions in regard to these instruments or the method described.

SOCIETY PROCEEDINGS.

BRITISH MEDICAL ASSOCIATION.

Seventy-first Annual Meeting, held at Swansea, July 28-31, 1903.

SECTION OF LARYNGOLOGY AND OTOTOLOGY.*

PATRICK WATSON WILLIAMS, M.D., President.

Introductory Remarks by the President.—On the Position of Laryngology and Otology in the Medical Student's Curriculum.

GENTLEMEN:—My first and pleasing duty as President of this Section is to extend a very cordial welcome to those distinguished colleagues who, in response to our invitation, have come from afar and at considerable personal inconvenience to assist us with their ripe experience in the various questions we propose to discuss. Indeed, it is the generous co-operation which our foreign *confrères* are always so willing to afford that brings home to us the practical importance of the topics that are here discussed, and the necessity for the more systematic training of medical students in the clinical examination of the nose, throat, and ear, so that every qualified practitioner may be familiar with at least their commoner diseases, and able to interpret those phenomena which in their pathological significance directly bear on general medical diagnosis.

The wish so earnestly expressed by an early Elizabethan dramatist—

I would you had a window in your heart,
I might look through you:

is only half-realized to-day; but in our own territory is fulfilled by those special devices for which our medical forefathers must have longed. It is easy now to differentiate an enlarged turbinate body and a polypus, or to distinguish between the presence of ulcers or other intra-nasal affections and accessory sinus disease, as sources of nasal discharge. We know, too, that nasal disease accounts for many cases of recurrent headache still often erroneously diagnosed as functional or organic nervous disease, while outbreaks of diphtheria are not very rarely due to the existence of latent intra-nasal diphtheria in a nurse, servant, or teacher.

Laryngoscopic examination as an aid to diagnosis in general medicine is not less valuable than the examination of the eye. How often

* Published by courtesy of the *British Medical Journal*.

does the existence of a vocal cord paresis or paralysis prove invaluable in the early diagnosis of central nerve disease, such as tabes dorsalis or bulbar paralysis, while every laryngologist knows full well that the larynx will frequently yield the one and only definite physical sign pointing to the existence of an intrathoracic aneurysm or other less common forms of intrathoracic tumors. The distinction between a simply laryngitis and paresis of an otherwise healthy vocal cord is not a difficult matter, and yet from want of a little familiarity with the laryngoscope, is often enough beyond the ken of the young practitioner.

Therapeutical success in medicine depends especially on the recognition of serious disease in its earlier and more tractable stages. The importance of taking things in time was voiced by Ovid in the well-known lines:

*Principiis obsta; sero medicina paratur,
Cum mala per longas invaluere moras.*

Happily rendered by:

*Resist the young disease; who stays too long,
His leech perchance shall find the foe too strong.*

(S. T. Irwin.)

We are no longer content to await the development of the grosser manifestations of advancing laryngeal tuberculosis before diagnosing the disease and adopting measures for its arrest. Every practitioner should realize the possible clinical import of simple hoarseness, and have sufficient knowledge of the larynx to be put on his guard ere the thickening of a cord, or the localized tumefaction on a vocal process, or in the interarytenoid fold, has either spread locally or has masked the existence of an early pulmonary lesion till it progresses beyond the possibility of cure.

If early recognition of laryngeal tuberculosis has done a good deal towards the successful treatment of this disease, far more is it essential in the radical extirpation of cancer, and I am certain that my colleagues, who are about to address us on this topic must deplore the lamentable number of cases that pass beyond the hope of relief simply for want of earlier diagnosis.

At the medical examination for entry into the navy and army the teeth are carefully inspected. Many candidates are thrown out for some error of refraction that could be remedied by wearing spectacles, or for some defect in chest measurement of little importance in after-life, and so forth, yet unless the candidate is obviously deaf the existence of serious aural disease may escape observation. Quite recently a young gentleman came to me, directly after he had passed his medical examination for the army, on account of deafness, which

he had noticed for six or seven years. He had nerve deafness, and could not hear the watch on contact on one side, while the hearing on the other was 11-60 only.

It is an old saying that history repeats itself. Although we cannot associate the term science with the semi-barbaric empiricism above which the healing art has never risen whilst linked to priestcraft, yet in this ancient Egyptian temple we observe that inevitable development of scientific progress, which in latter days first separated the practice of medicine and surgery and has now further subdivided each into the several special departments represented in the numerous sections of our own annual meetings. The training of our medical students should certainly include the investigation and treatment of the simpler affections of the special regions, so that in due time he may undertake such cases in his own practice, and be competent to act as did the High Priest of Thebes when serious difficulties arose—a function too often undertaken for themselves by the suffering public.

I have but touched on one or two of the more striking points which show how essential is some elementary knowledge of laryngology in general practice, and to support my plea that it should no longer be left to the student's discretion whether he attends the hospital clinics or not. Practical acquaintance with obstetrics, diseases of women, and ophthalmology and dermatology is demanded of him, and in fairness to the student those who are responsible for the arrangement of his curriculum should remedy the existing defect.

Post-graduate teaching is an altogether different matter, and while invaluable as a means of extending the practitioner's knowledge of all the special and higher branches of medicine and surgery it is beyond the reach of many medical men, and therefore, it should not be relied on as the chief if not only means of obtaining elementary practice in the treatment of any regional disease.

Contrary to the very general impression, specialism in medical practice is not a recent development, for we learn from Ebers¹ that in Egypt as long ago as the thirteenth century B. C. there was a school of specialists attached to the College of Priests in Thebes. They were physicians to the king, and were consulted in all serious cases. "It was left to the principal of the medical staff of the sanctuary to select that master of the healing art whose special knowledge appeared to him to be suited for the treatment of the case."

* Uarda, vol. ii, p. 82.

Discussion on the Operative Treatment of Malignant Diseases of the Larynx.

SIR FELIX SEMON said: The history of radical operations for malignant disease of the larynx is of comparatively recent origin. The larynx was of old considered as an organ indispensable to life, a view not to be wondered at considering that its graver organic diseases, such as cancer, tuberculosis, tertiary syphilis, leprosy, external injuries, etc., if unchecked, practically always ended fatally. In accord with this state of public opinion we find that, until the demonstration by Professor Czerny, then Billroth's assistant, in 1870, namely, that dogs, from whom, under proper antiseptic precautions, the larynx had been removed *in toto*, could, and did, survive the operation for an indefinite period, the operative treatment of malignant disease of the larynx was limited to palliative tracheotomy when the obstruction caused by the new growth threatened to extinguish life by asphyxia.¹

The success of Czerny's experiments induced Professor Billroth, and following him other surgeons, to remove the entire larynx or large parts of it in cases of malignant disease, and it will be remembered what a sensation the report of the first cases thus operated upon created at the time. Unfortunately, however, the results did not correspond to the hopes which had been entertained. Most of the patients either died from the consequences of the operation itself or succumbed to recurrence soon afterwards. When the late Dr. Foulis presented in 1881 his tabulated account of the cases of total and partial laryngectomy performed until 1881, he had to confess that out of 25 cases of total extirpation of the larynx so far performed for malignant disease, not one of the patients had been reported alive at the end of the first year after operation, whilst only two of them had lived to 9 and 10 months respectively. Of the 6 cases of partial extirpation of the larynx then on record, one patient died two days after the operation, two succumbed to recurrence within six months, two others died within the first year from affections apparently not connected with the operation, and one patient only was alive fourteen months after the left half of the larynx had been removed. In spite of these not very encouraging results, both operations continued to be practiced, although not very extensively, until improvements in the technique, particularly of partial extirpation in the hands of Dr. Eugen Hahn, of Berlin, gradually led to better results with regard to diminution of the danger of the operation itself.

¹ It is true that in 1866 Sir Patrick Heron Watson of Edinburgh removed a syphilitic larynx *in toto*, but this solitary operation became only known to the world in 1881 through a communication made by the late Dr. Foulis of Edinburgh to the Laryngological Section of the International Medical Congress of London. (Transactions of the Sub-section for Diseases of the Throat, p. 87.)

Meanwhile another form of radical operation—namely, thyrotomy, with removal of the soft parts round the new growth—had not fared better than the more serious operations just mentioned. In 1878 Paul Bruns passed a most destructive criticism on the efficiency, and, indeed, the admissibility of thyrotomy in malignant disease of the larynx. It must be confessed that the statistics on which he based his judgment fully justified his condemnation. Out of 19 cases of cancer of the larynx which had been treated by thyrotomy until 1887, two patients died shortly after the operation; in not less than sixteen local recurrences occurred either immediately after the operation, or very few months afterwards; in one single case only was recurrence retarded for more than one year, and in one case death took place twenty-two months after the operation from cancer of the suprarenal glands, whilst there was no trace of recurrence in the larynx itself. On the strength of this result, Paul Bruns arrived at the conclusion that “attempts to extirpate the disease by means of thyrotomy have shown themselves to be altogether insufficient and useless.”

The reasons of this unsatisfactory state of things are not far to seek. Without denying that additional features may have played a role, I have no hesitation in saying that two causes above all others operated in rendering radical operations in those early days so very unsatisfactory. In the first place our clinical knowledge of malignant disease of the larynx was so incomplete that the diagnosis was usually only made at a time when operative interference of any kind had extremely little chance, and even then but too frequently endeavors were made to limit the operation to procedures, such as thyrotomy with removal of the soft parts only, which, although excellent in early stages, are totally insufficient when the disease is more advanced. Secondly, the technique of the various forms of operation so far discussed was still in its infancy; pulmonary complications arising from the inability to sufficiently protect the lower air passages against the entry of blood, and later on of septic matter from the wound, were of appalling frequency, and carried away by far the greater part of the patients who had been subjected to these operations.

The first of these reasons explains the failure of thyrotomy, the second one, the horrible mortality after partial, and still more after total extirpation of the larynx, and although the latter gradually decreased, still as late as 1888 the statistics of Schwartz, Scheier, and Baratoux showed no more than 8 to 13 per cent. of real cures after total extirpation for malignant disease of the larynx.

An unusual opportunity of improving this unsatisfactory state of things was afforded by the illness of the late German Emperor, which for a time concentrated the attention of the whole medical world upon malignant disease of the larynx. It is true that already some time previous to this, efforts had been made from various quarters, and in various directions, to improve both our diagnostic and our therapeutic powers. Thus, as already stated, the late Dr. Eugen Hahn had in various respects improved the technique, particularly of partial extirpation of the larynx, and had by the invention of his excellent sponge canula materially diminished the risk of septic pulmonary complications after operation, whilst I, when bringing the case of the late Mr. Montagu Williams, who had been operated upon by Hahn, before the Clinical Society in 1886, had drawn attention to several so far unknown, or at any rate, undescribed signs, which had enabled me in a number of cases to make the diagnosis of malignant disease of the larynx earlier than usual. There can, however, be no doubt that it was the illness of the then Crown Prince of Germany, and the discussion connected with it, which led to a considerable improvement both in the diagnosis and in the operative treatment of malignant disease of the larynx. The questions whether innocent laryngeal growths show a special tendency after intralaryngeal operations to undergo malignant degeneration; whether clinical observation or microscopic examination of intralaryngeally removed fragments of a new growth ought to decide our action; the differential diagnosis between innocent and malignant tumors of the larynx; the statistics compiled by various authors, and other points of interest formed for a time topics of burning universal interest, and the collective investigation, which, with the help of most of the leading laryngologists, I instituted into these points, materially contributed, I venture to think, towards a better understanding of most of these mooted questions. Shortly afterwards (in 1889) Mr. Butlin demonstrated that, owing to our diagnostic improvements, thyrotomy ought to be reinstated in the place which, owing to defective diagnostic knowledge and imperfect execution it had lost.

From this time onward curious national differences developed concerning the whole question of operative interference in malignant disease of the larynx. Whilst in this country, operators, trusting to Butlin's and my own statements, followed in the same lines, and thereby obtained results by the early performance of thyrotomy in suitable cases, which are as gratifying as the nature of the terrible disease with which we have to deal will permit, the development on the European continent, and in America was a widely different one.

The old truth, that it is more difficult to reestablish in public favor a discredited procedure than to introduce a brand new one, held good again. Up to the present moment, with the exception of a few Continental specialists and surgeons, such as Chiari, Moure and Schmiegelow, who have worked on parallel lines, and have obtained similarly gratifying results as British operators, thyrotomy is still looked upon abroad with more or less universal distrust and apprehension. On the other hand, in Germany, intra-laryngeal operations in early cases of malignant disease of the larynx have been, and still are warmly recommended, and in America the astounding doctrine has been promulgated that as soon as the naked-eye diagnosis of malignant disease of the larynx has been made, not only the whole larynx, but also all its tributary lymphatic glands should be at once excised.

Thus we are as far from a consensus of opinion on the principles which ought to guide us in operating upon malignant disease of the larynx as we were at any period since radical operations for this class of diseases were introduced, and the method to which we naturally look for help and guidance under such circumstances, for example, the statistical, has in my humble opinion, done more harm than good in this particular question. Let me justify this statement. I am myself a convinced adherent of the statistical method, but I am at the same time fully conscious that it is a double-edged weapon, and that by putting the question at issue wrongly, or by employing statistical material without close scrutiny, most fallacious results might be obtained. It is not difficult to prove this with special reference to our subject.

Statistics might be employed to show broadly the general results so far obtained by a particular operation by simply grouping all the cases together that have ever been operated upon by that method. There is not a word to be said against this so long as there is only the question of satisfying the reader's curiosity as to the sum of results obtained, but when it is desired to decide the value of a particular form of operation, nothing could be more misleading than to simply heap together all such operations ever performed at any time, and by anybody, and to draw conclusions from the bare result of such an indiscriminate array of cases as to the real efficacy of that operation.

Some years ago I proved this contention, when Dr. Sendziak grouped together all cases of malignant disease of the larynx ever treated by thyrotomy from the introduction of that operation until the date of the publication of his paper, and when he arrived, as he was bound to do, at an opinion very unfavorable to that form of

operation. By critically analyzing his statistics, and by showing that the real efficiency of thyrotomy was much more truly shown by the results of single observers, who have had the opportunity of acquiring particular experience, than by wholesale enumeration of all cases ever operated upon by that method, I think that I invalidated several of his conclusions. Unfortunately, however, my criticism, the justice of which was later on acknowledged by Sendziak himself, has shared the usual fate of such rectifications—that is, the original statements have passed into most surgical and laryngological textbooks, and very little notice has been taken of my correction, the result being that thyrotomy for malignant disease of the larynx continues to be looked upon with considerable distrust abroad.

Another drawback to statistics in this question is that no general principles are agreed upon, according to which they ought to be prepared. Thus the views of authors who have given us statistics on the question of radical operations for malignant disease of the larynx materially differ as to the period when the patient may be looked upon as “cured” after operation, some demanding a period of three years, others of two, whilst I from large experience am convinced that unless recurrence takes place within one year from the operation the word “cure” can safely be employed. In my experience of 18 thyrotomies for microscopically established malignant disease of the larynx I have not met with a single case in which recurrence, either local or elsewhere, has taken place after more than one year after operation.

Again, artificial subdivisions are being made by some statisticians as to whether soft parts only are removed at the operation, or whether fragments of cartilage may have to be taken away at the same time, the former class alone being included by Sendziak and others under the heading of “thyrotomy,” whilst to all cases in which portions of cartilage had to be removed, the proud name of “partial extirpation of the larynx” is granted. Now it does not make in my experience the least difference in the gravity of the operation, the course of healing, and the ultimate result whether you may have to remove soft parts only, or whether additional small parts of the arytenoid cartilages or of the thyroid or cricoid may have to be resected; yet by separating such cases from the rubric of thyrotomy, and quoting them under the title of partial extirpation of the larynx, a number of cases which rightly belong to the province of thyrotomy are artificially removed from their natural position.

Further, in many of these statistics carcinoma and sarcoma of the larynx are treated in different chapters. From the pathologic point of view this course is correct enough, but with regard to

indications for operation itself, and its results, such subdivision is, according to my personal experience, quite unnecessary.

The result of all this is that the material is broken up in such a curious, and I honestly believe, unnecessary and undesirable manner, as to ultimately lead to very erroneous conclusions as to the value of the individual forms of radical operations for malignant disease of the larynx. I have on various occasions dilated upon this very important question, and would like to do so more fully now again, but the limited time at my disposal prevents me from doing so, and I can only throw out the above suggestions with a view of emphasizing the fact that conclusions drawn from an indiscriminate employment of the statistical method in this question ought to be received with critical caution.

We possess at present five different operative methods of dealing with malignant disease of the larynx, and inasmuch as no internal medication of any kind has as yet enabled us to cope with that terrible disease, the only questions to decide under such circumstances are: when shall we operate, and what method shall we select?

There is, I think, unanimity amongst those who know anything about the subject, that as a general principle operation should be at once proceeded with if the case lends itself at all to operative interference as soon as the diagnosis is made. It is unfortunately true enough that not only the public, but a not inconsiderable proportion of the medical profession are still possessed by the idea, "once cancer, always cancer." But if anything could be calculated to rouse these sceptics from their present pessimistic attitude, surely it ought to be the brilliant results which we are now obtaining just in cancer of the larynx when the diagnosis has been early made, the suitable operation been selected, and no precious time been lost. The dictum of my unforgettable teacher, Virchow, "If cancer be at its onset and often for a long time a local disease, it must be possible to cure it at that stage by local treatment," ought to be our guidance in this whole question.

True, we must distinguish between intrinsic and extrinsic malignant disease of the larynx, the former comprising the true interior of the larynx from the ventricular bands downwards, the latter the tumors situated on the aryteno-epiglottic folds, the arytenoid cartilages, epiglottis, and the posterior wall of the cricoid cartilage.

The distinction from a practical point of view is all important. The intrinsic form remains much longer a purely local affection, and shows very little tendency until the disease is much advanced to infect the neighboring lymphatic glands, whilst in the extrinsic form such glandular infection unfortunately makes its appearance as a rule at a

very early stage. Upon this one fact depends the enormous difference between the two forms with regard to prognosis, extent and danger of the operation, and probability, or otherwise, of recurrence, and it is likely that this difference will ever continue to exist as long as we are compelled to combat the disease by operation; but, whether extrinsic or intrinsic, under all circumstances must it be our aim to establish the diagnosis as early as possible, and when it is secured, or even in a few cases when it is somewhat doubtful, to proceed energetically.

In very few diseases is the question of time so all-important, in very few does the loss of precious time revenge itself so cruelly as in malignant disease of the larynx! I shall have a few more words to say on this point at the conclusion of my observations, but wish now to pass in brief review the various forms of operation at our disposal.

1. There is first of all the *intralaryngeal method*, which was recommended for more general use in Professor B. Fraenkelf's, of Berlin, well-known paper, "Laryngeal Cancer, its Diagnosis and Treatment,"² on the strength of several successful operations performed by himself. I did not refrain, much as I disliked to oppose the views of not only an intimate personal friend, but also of one of the most prominent laryngologists, from at once expressing grave doubts as to the *rationale* of this form of operation in cases of malignant disease of the larynx.³ Since then, time, so far from effacing my objections, has deepened them, and on an occasion like this it is my duty to give again fresh expression to them. Not that I doubt that in some exceptional cases the intralaryngeal method may not achieve enticing triumphs in cases of malignant disease of the larynx; but it is not with the splendid exceptions, but with the general principle of the application of a method that I have to deal here. And from this point of view it is my duty to say that in my humble opinion the intralaryngeal method, with some extremely rare exceptions, of which more anon, is absolutely unsuitable for the radical extirpation of malignant disease of the larynx, and that its employment in cases of this kind is diametrically opposed to and irreconcilable with the principle which is universally acknowledged as the guiding one in dealing with malignant growths in other parts of the body. I fear no contradiction when I say that this principle is that not only the tumor itself, but an area of healthy tissue in all directions round

² *Deut. med. Woch.*, 1888, Nos. 1-6.

³ See my concluding remarks in the report of the Collective Investigation on the Question of the Transition of Benign into Malignant Growths, particularly after Intralaryngeal Operations (Berlin: August Hirschwald, 1889, pp. 187 *et seq.*).

the new formation ought to be removed in order to make the operation really radical. Now I make bold to say that intralaryngeal operations do not afford the least guarantee, by however skillful hands they may be carried out, that this first and most indispensable demand has been complied with. The intralaryngeal method is excellently adapted to the removal of growths from the surface of the laryngeal tissues, and it is in connection with such growths that it celebrates legitimate triumphs. But it is characteristic of malignant neoplasms that they not merely rise from the surface, but above all that they infiltrate the mother soil, and I maintain that with this often enough insidious infiltration, the intralaryngeal method is not competent to deal. When first I raised my objection to Fraenkel's proposals, I stated that it had made a deep and ever-renewed impression upon me, that usually, when I had opened the larynx in external operations for malignant disease, I had found that the affection was much more advanced than had appeared from mere laryngoscopic inspection. Since 1889, when I penned those lines, my experience in this class of cases has greatly increased, and with increased experience the fact that the disease is almost always much more advanced than one would have thought from the laryngoscopic inspection, has more and more deeply impressed itself upon me. Under these circumstances I am convinced that it ought not to be the ambition of the intralaryngeal method to compete with really radical operations on a field in which, by the nature of things, no general successes can be obtained by it. The advantages which are claimed for it, such as that no external operation, usually so much dreaded by the patient, is required; that the patient should never be laid up; that the vocal results are better than after external operation, etc., in my opinion sink into insignificance in comparison with the dangers which loss of precious time and undue postponement of really radical operation brings about. We hear occasionally of a few cases which have been successfully treated by the intralaryngeal method and remained well, but how about those in which after intralaryngeal treatment ultimately external operation became unavoidable, and which then had to be much more extensive than it would had the patient at once been subjected to external operation? Not many cases of that sort will be found recorded in contemporary literature, and yet I suspect they are anything but rare. Even the advantage claimed for these cases that the patient is never laid up for a single day is, in my opinion, more than counter-acted by the need, not only of usually very prolonged attendance until the growth has been apparently completely exterminated, but by the even more urgent need of the patient keeping himself for an almost indefinite period under

observation in order to be sure that this happy consummation has been really arrived at. And, personally, I must say that after what I have seen of malignant disease of the larynx, I should, even after an apparently successfully intralaryngeal operation for malignant disease, never feel satisfied in my own mind that I had succeeded in actually radically extirpating the growth, and that I do not think that even in successful cases the gain is commensurate to the risk. I will not deny that in some quite exceptional cases, such as when malignant disease begins at the tip of the epiglottis and is recognized whilst it is still quite limited to the peripheral part of that structure, removal of the whole epiglottis by means of the snare or of the knife from within may not be legitimately attempted, but although I have myself reported a successful case of intralaryngeal removal of an epithelioma of a vocal cord—the removal had been intended for the purposes of a microscopic examination of the growth, and unexpectedly turned out to be radical—and although even now the patient continues well, I should never deliberately try to remove an intrinsic cancer or sarcoma from the larynx by intralaryngeal operation.

2. *Thyrotomy*.—Speaking before an audience of British laryngologists I need not say much in praise of this operation, the advantages of which most of us have learned to appreciate from personal experience, and which is indicated in all cases of intrinsic malignant diseases of the larynx, in which the diagnosis is made at a time when the disease is not too extensive, nor apparently too deeply infiltrating. I firmly believe that, under such circumstances, thyrotomy and thorough removal of the growth, with a sufficient circumference of healthy tissue, and accompanied—as individual cases may require—by removal of small fragments of cartilage in the neighborhood, is positively an ideal operation. I have now performed twenty thyrotomies of this character in cases of undoubtedly malignant disease of the larynx (the microscopic examination of the growths was in all instances made by Mr. Shattock) and have had nineteen recoveries, with two—I may fairly say quite doubtful—recurrences and one death from operation. In two of my cases the operation has been too recently performed to allow one to speak of lasting cures. All my cases having occurred in private practice, I have had the opportunity of following up to the present moment the fates of all my patients, and being convinced from my personal experiences that no recurrence need be feared if the patient has remained well for a full year after the operation, I can now summarize my results to the effect that out of eighteen cases of undoubtedly malignant disease of the larynx which I have operated upon by thyrotomy between June 2, 1891, and July 29, 1902, 15, that

is 85 per cent, are now alive and well, whilst the vocal results, with the exception of a few cases in which it was necessary to remove both vocal cords, are surprisingly good. This list does not include cases of doubtful malignancy, of which I have operated upon four by thyrotomy with one recurrence, nor two cases in which the disease was found to be tuberculosis, nor one case in which recurrence took place and proved the papillomatous nature of the growth.

I hope to lay a full report of all my personal experiences with regard to this matter during the coming winter before the Royal Medical and Chirurgical Society, but on the present occasion I felt that it would not be right to monopolize by a detailed account of my own experiences the time allotted to me for the introduction of the subject. Anyhow, I hope that even this bald account of my results will tend to convince the greatest sceptic that if this operation be restricted to the cases in which it is really applicable, its results are, as I have called them in the syllabus of my remarks, "perfectly ideal." But in order to obtain such results the following conditions are absolutely essential:

1. The operation must be restricted to early stages of intrinsic malignant disease.
2. For this purpose an early diagnosis is indispensable.
3. The operation when performed must be thorough, that is, no sentimental considerations concerning the amount of vocal power to be retained by the patient must interfere with the imperative necessity of removing a sufficient area of healthy tissue round the new growth in all directions. A violation on one single part of the periphery of the new growth of this rule may frustrate the entire purpose of the operation.
4. Should it be found after opening the larynx that the disease is more advanced than it appeared from laryngoscopic examination, it is the duty of the operator not to limit his interference to the operation originally contemplated, but to perform partial laryngectomy, or indeed any other operation, the necessity of which may become apparent when the extent and depth of infiltration of the new growth has been definitely ascertained.

If these demands be complied with, the position of thyrotomy, as being *the* operation in early stages of intrinsic malignant disease of the larynx will remain impregnable so long as we have to fight malignant disease by operation. Of course I do not mean to say that even if all these rules are adhered to, a lasting cure can be guaranteed; such a statement would be ludicrous, seeing the insidious nature of malignant disease, and the impossibility of deciding for certain whether or not before the operation infectious elements may have

emigrated into the neighborhood. The practical results, however, obtained by so many British operators, and by Chiari, Moure and Schmiegelow on the Continent, show that with proper selection of cases and sufficient energy of operation most satisfactory results are obtained. But if in any of the points named above, half-hearted concessions are made, thyrotomy is as likely to become discredited again as it was when Paul Bruns passed his stringent criticisms. No better illustration of this could be given than a communication made at the recent International Medical Congress at Madrid: On that occasion the results of radical operations for malignant disease of the larynx performed in a Spanish clinic were reported, and it was stated that out of eight thyrotomies performed, no less than six ended in recurrence from within one month to two years after operation. The reporter arrived at the conclusion that the results of thyrotomy were very uncertain.

This report appears to me simply deplorable. In the absence of details I cannot, of course, venture to enter upon any detailed criticism of the cases, but, having just told you that out of thyrotomies performed by myself in cases of undoubted malignant disease of the larynx, recurrence—and this very doubtful—only took place in two cases, I have no hesitation in saying that there must have been something radically wrong either with the selection of these special cases for thyrotomy, or with the performance of the operation. No other explanation will hold good when such discrepancies occur in the results of one and the same operation in two different hands. One of the most regrettable incidents in connection with the unsatisfactory Spanish results will, of course, be the fact that these cases will pass into future wholesale statistics, and will again contribute towards discrediting the operation in the eyes of those who have had no opportunity of acquiring experiences of their own.

With regard to the technique of the operation, I have but little to add to the description which I gave in the *Lancet* in 1894. Having now treated a number of cases by immediate complete closure of the entire wound, I have not seen any advantage from that procedure, whilst it prevents one from testing the patient's power of swallowing after the operation; and, in my opinion, increases the danger of septic complication. I have, therefore, returned to the method I described in 1894—that is, to immediately close the larger upper part of the wound, and leave the lower part open for two or three days after the operation until all danger of septic complication has passed.

Another point I should like to mention is this; that in cases in which the growth was situated in the anterior commissure, and in which it was necessary to remove the anterior parts of one or both

vocal cords, I have recently repeatedly stitched their posterior ends to the verricular bands, with the result of obtaining much better vocal results than had resulted without this procedure.

3. *Partial Extirpation of the Larynx*.—By partial extirpation I mean an operation in which no less than one entire wing of the thyroid cartilage, and possibly additionally an arytenoid and parts of the cricoid cartilage are removed, but, I do not include in this category, as I have stated before, cases in which it was only necessary to take away small fragments of these cartilages.

The operation in itself does not offer any greater technical difficulties than mere thyrotomy, but it is still, I think, a moot question whether the after treatment may be conducted on exactly the same lines as that operation—that is, whether the wound may be at once closed in almost its entire length, or whether it should be kept open at first, in order to avoid subsequent stenosis of the parts. In one case I have followed the former plan without any unpleasant amount of narrowing resulting, but I do not venture on the strength of so isolated an experience to recommend a general adoption of this plan, and hope that the subsequent discussion may throw some light upon this question. Altogether I am convinced that partial extirpation of the larynx will come to be more rarely performed in proportion to the diagnosis of malignant disease being arrived at more and more early, experience having shown me that even in cases of rather extensive intrinsic malignant disease, thorough removal of the growth and soft parts around it, with subsequent energetic scraping of the base, is sufficient to prevent recurrence. Only if the new growth should be found to have actually invaded the cartilages, will complete removal of the latter become indispensable.

4. *Total Extirpation of the Larynx*.—As the result of a very curious misunderstanding of some observations which I made as far back as 1881, in the discussion on the treatment of laryngeal cancer in the Sub-Section for Diseases of the Throat, of the London International Medical Congress, I have been persistently reported as an avowed opponent of total laryngectomy, and in spite of repeatedly expressed disavowals of the attitude attributed to me, in which I again endeavored to clearly define my views concerning that operation,⁴ the legend has, I regret to say, recently been again revived in Dr. Jonathan Wright's otherwise excellent history of laryngology and rhinology. The author actually describes Mr. Butlin and myself as "resenting total extirpation as unjustifiable," and states that we have of late years reiterated these views. I take this opportunity of

⁴ *Archiv f. Laryngologie*, vol. vi., Heft 8; *Encyclopædia Medica*, vol. vi., xiii., Internat. Med. Cong., Paris, 1900, Section de Laryngologie.

restating that we have done nothing of the kind. Total extirpation is an operation over which, however much I may admire the skill of the surgeon who saves a patient from an otherwise unavoidably painful death, I cannot grow enthusiastic, and that whatever may be done to alleviate the patient's after-existence, it cannot certainly be described as a pleasant one. But I have never denied, nor do I now, that in cases in which the disease begins in a situation which *a priori* renders it impossible to eradicate it by less heroic means, such as on the posterior wall, or on the oesophageal aspect of the larynx, or when it has not been sufficiently early recognized and allowed to grow beyond the limits of thyrotomy or partial extirpation, its performance may become unavoidable to save the patient's life. If my attitude has altered at all, it has done so in the sense of my looking more favorably upon the operation since by the general adoption of the American method of shutting off completely the lower part of the trachea, through stitching it to the skin, from the actual field of operation, the dangers of septic complication have become materially diminished, and since by the invention of ingenious prothetic appliances, the after-existence of the patients and their power of making themselves intelligible has been considerably ameliorated. Still I cannot say that I am enamored of this operation, and I think that even the most daring surgeons, as whose representative we have the pleasure of welcoming to-day Professor Gluck, of Berlin, than whom no living surgeon has obtained more brilliant results in this class of operations, will agree with me, that it ought to be the aim of every practitioner to recognize the disease at so early a period, that we may be able to save the patient by thyrotomy, instead of having recourse to total extirpation. That the latter operation will ever be superseded, so long as our treatment of malignant disease of the larynx is exclusively surgical, I do not believe for a moment, because in extrinsic malignant disease, and particularly when it is situated on the posterior surface of the cricoid cartilage, the smaller operations are of no avail. But seeing—to conclude from my own experience—the incontestable fact that intrinsic malignant disease is undoubtedly far more frequent than extrinsic, it may confidently be hoped that by an earlier recognition, and thorough extirpation by means of thyrotomy of the former variety, the number of cases of total extirpation may become more reduced in number as years pass on. With regard to the technique of the operation, its incidents, its general, immediate, and remote results, I cannot speak from personal experience, and gladly leave this part of our subject in the hands of its most experienced exponent, Professor Gluck.

5. *Subhyoid Pharyngotomy*.—Of this operation I have but to repeat what I have said on former occasions. It is suitable for cases in which the disease starts from the epiglottis, or from the aryteno-epiglottidean fold, and its technique is an easy one, whilst it affords a good view of the field of operation. A curious fatality has, however, reigned over this operation, the causes of which have not as yet been sufficiently elucidated. It may be hoped that with further experience these results may improve.

6. *Palliative Tracheotomy*.—This operation, according to the present state of our knowledge, ought only to come into question when either the disease has started in a locality in which nothing short of total extirpation of the larynx could come into play, and when the patient declines to submit to that operation, or when the disease, although starting in a more favorable locality for the milder forms of operation, has unfortunately not been recognized early enough to allow of the milder forms of radical operation. But I strongly hold that in view of our present results, no member of the medical profession ought to allow a patient of his, afflicted with malignant disease of the larynx, to drift into that hopeless condition when palliative tracheotomy affords the only means of prolonging a deplorable existence. Should it have to be performed, it ought, needless to say, be done as far down as possible in order to avoid that, before the end of life, the disease should actually extend into the tracheotomy wound, when the cannula would have to lie in a fungating mass, and by the difficulties connected with its cleaning and re-introduction further increase the sufferings of the unfortunate patient.

In conclusion I wish to make a few observations on some points intimately connected with the question of operative treatment in malignant disease of the larynx, although not of an exactly surgical nature.

First of these is the question of arriving at a reliable diagnosis of the disease.

Eight years ago Mr. Butlin, in a discussion on laryngeal cancer in the Section for Disease of the Throat of the British Medical Association at London, stated that "we must admit that there are three classes of cases: the first in which any one and every one can make the diagnosis; the second in which the better instructed or more experienced make it, and others do not; and the third class, in which the conditions are so obscure that no one can make the diagnosis unless the larynx is opened, and in some of which it is even then difficult to say what the nature of the disease is."⁴

⁴ *British Medical Journal*, vol. ii., 1895, p. 1034.

No truer words were ever spoken, and the description then given even now fully applies. Whilst I maintain everything that I have ever taught of the value of certain early signs of malignant disease, I am as ready as I ever was to admit that practically none of these signs taken by itself is absolutely conclusive, and that even if several of them should occur together, the possibility of a diagnostic mistake is not absolutely excluded. I think here more particularly of a contingency of which I have seen two examples during the last few years—namely, of malignant disease being simulated by tuberculous tumors of the larynx. But even apart from this, errors are possible between benign and malignant growths occurring in older persons. This being so, most of us hold, and I think quite rightly, that whenever possible, fragments of the suspicious growth should be removed from within, and submitted to microscopic examination at the hands of an expert. Should this examination result in the establishment of the presence of a squamous-celled carcinoma or other unmistakable form of malignant disease, the advantage thus gained is of course great. Unfortunately, however, it is not always possible to remove pieces from within, and even when it is, the evidence of the microscopist may be in some cases doubtful, whilst in others, owing to non-characteristic fragments only having been removed, the evidence may be directly misleading.

There are also cases on record in which the clinical aspect and the course subsequently taken by the disease were irreconcilable with the verdict given by the microscopist. Under these circumstances I still hold to the view that, whilst the microscope may be of infinite value in deciding the thorny question of diagnosis, its role in this question is that of a helpmate, but not of an infallible arbiter, and that the clinical observer must have the courage of his own opinions, and perform an exploratory thyrotomy in suspicious cases even when the microscope has not given an unambiguous reply as to malignancy. Even after opening the larynx, as Mr. Butlin has quite rightly said, it is sometimes not possible to definitely decide what kind of growth one has to deal with, and from an ethical point of view the rather thorny question may arise: How to treat the growth under such circumstances? Personally, I do not hesitate to say that if justified doubts exists, it is more in the interest of the patient to treat the suspicious growth with its surroundings as if it had been proven to be malignant. True, subsequent microscopic examination may and will show in a few such cases that the growth was innocent, and that milder measures might have sufficed, but these cases are, in my own experience, very exceptional indeed, and ought not, I think, to be allowed to outweigh general experience.

In close connection with the points just discussed is one final question, the importance of which was brought home to me rather forcibly by a recent case of my own. A patient, aged about 60, was sent to me by a well-known laryngologist, with the diagnosis of malignant disease of the larynx. On laryngoscopic examination an irregular, snow-white, sharply pointed papillomatous-looking growth was seen to occupy the posterior part either of the right vocal cord or of the posterior part of the ventricular band, and of the interior surface of the right arytenoid cartilage. It seemed also possible that all these three parts might be affected. There could, however, obviously be no deep infiltration, as the movements of the right cord were perfect. Seeing the situation, and the appearance of the growth, as well as the age of the patient, I, too, had no doubt that the disease was malignant, and recommended, as the original adviser had done, immediate operation. Our advice was followed. When I opened the larynx I found that the growth occupied the whole posterior part of the right vocal cord and the inner aspect of the right arytenoid cartilage. I removed the right vocal cord, and the anterior part of the right arytenoid cartilage, with an area of healthy tissue around the growth. The patient made an uninterrupted recovery, left the home exactly one week after the operation, and his voice within a short time became almost normal.

The growth was sent to Mr. Shattock, who, to my greatest surprise, reported that he did not consider the growth a carcinoma, but a papilloma with a somewhat pronounced horny covering of epithelium. On my urging the clinical reasons for strongly suspecting malignancy, Mr. Shattock replied that, although the growth could not be readily classed as a carcinoma, nevertheless it was just such a tumor as might at any time take a malignant character, not being a common papilloma, with closely pressed, rounded projections, but with projections more pointed, and covered with an excess of squamous epithelium. The histological and clinical characteristics were not really as discordant as might at first appear.

I of course considered it my duty to at once communicate the result of Mr. Shattock's examination to the patient's general medical attendant, and we earnestly discussed the question whether any, and if so what, information should be given to the patient himself. Three courses obviously were open.

1. To tell the patient that the microscopic examination had resulted in a demonstration that the growth was non-malignant, and to say nothing further.
2. To state the result of the microscopic examination, but to add that this had not dispelled the clinical fears.

3. To say nothing for the present, and to wait until all fears of a recurrence had disappeared.

After careful consideration it was decided to adopt the third course, as the kindest to the patient, and, in our joint opinion, the wisest in view of the situation. We could not honestly tell the patient that the result of the microscopic examination had superseded the clinical diagnosis, as neither of us believed this, and to tell him of the doubts besetting his case would have meant to produce, whilst he had been quite reconciled to his affection being malignant, a condition of mental unrest positively detrimental to his health. In accordance, therefore, with our decision, I only told the patient on his direct question as to what had been the result of the microscopic examination, that it had shown the growth not to be of the most malignant type.

I saw the patient six months after operation, when the condition of his larynx was first-rate, and his voice was almost normal.

Not quite six months after this I found to my great disappointment that the anterior part of the internal scar was occupied by a white, warty, flat new growth, which much reminded one of the original tumefaction, and was very suspicious looking. A fortnight later this growth was, if anything, a little larger, and the neighborhood of its posterior part looked very angry and red. Endeavors were made to remove a fragment for microscopic purposes, but the neoplasm was so flat that no piece of sufficient size for that purpose could be grasped with forceps. A consultation was subsequently held with Mr. Butlin, who, being put in full possession of all the facts of the case, unhesitatingly stated that he considered the new growth to be of a malignant type, and suggested speedy repetition of thyrotomy. Before, however, following this advice, which entirely coincided with my own view, I then considered it my duty to tell the patient of Mr. Chattock's favorable opinion of the nature of the growth primarily removed, and myself suggested that still further opinion should be taken, in order to satisfy the patient's friends that the course proposed was the correct one.

A monster consultation was then held in which no less than six medical men took part, and in which the unanimous opinion was arrived at that the growth was most probably malignant, and should under all circumstances be removed forthwith. The patient, however, who had until that moment been perfectly ready to follow my advice, suddenly upbraided me before my colleagues for having done him a great wrong by not telling him at once of the favorable verdict of the microscopist, and left in a huff. This happened about eight months ago. I have not since seen him, and am not able to say anything about the present condition of matters, but I have heard that

so far he seems none the worse for the condition of his larynx. From the scientific aspect, the case of course presents features of unusual interest: Was the original growth benign or malignant? Which was right—clinical observation or the microscope? Again, did the undoubted recurrence represent the return of an originally innocent or of a malignant growth, or was it possibly a keloid? It must be remembered that the original growth was situated on the posterior part of the right vocal cord and the arytenoid cartilage, whilst the present neoplasm is situated in the anterior aspect of the scar close to the anterior commissure. But quite apart from the scientific aspect, the ethical question forces itself upon our attention: What is one to say to the patient under circumstances such as those described? Having thought a good deal about this knotty question, I still think that the course I pursued was the right one. All the members of the medical profession who have been engaged in the case have agreed with my view, but I thought this a proper occasion to bring the whole question involved before a wider forum, and shall be glad to hear what course the members of this section think ought to be followed under similar trying circumstances to those described.

Finally, let me once more express my conviction that the operative treatment of malignant disease of the larynx, if pursued on the lines which are at present generally followed by British observers, will yield the more satisfactory results the sooner the diagnosis is made, and the earlier and the more thoroughly operation is carried out.

(To be continued.)

Tuberculosis of the Middle Ear, With the Report of a Case.—

Z. L. LEONARD (New York)—*The Medical News*, July, 1903.

The inference which the author draws from this case, is that the origin of the tuberculosis was in the ear, and the fact that both ears were affected would point to the view that the disease began in the vault of the pharynx and extended upwards. There is no doubt that the lungs were secondarily involved. The lesson to be learned is that we should make it a routine practice to submit to the microscopist for a diagnosis, the products of unhealthy discharges, not alone from the upper air passages but from the ears as well.

F. C. E.

